3M™ E-A-Rfit™ Validation System

Software User Manual

Leading the Advancement of Hearing Conservation™

3M

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Login Screen

Congratulations! This E-A-Rfit™ software user manual will guide you step-by-step through each screen of the software. The E-A-Rfit™ software will enable you to test the attenuation of many E-A-R hearing protection products by 3M.

Pressing the F1 button on your computer will open up the Software User Manual. Should you have any questions regarding the software, you are now one click away from manual and the answer!

In order to access all of the features of this software, the speaker must be connected to your computer before you launch the application. You may run the E-A-Rfit software without the speaker connected but with limited functionality.

Technician Code

Once your account is created, your Technician Code will be listed in the Technician Code drop-down.

The Technician Code is a combination of 4 letters (first 4 letters of your last name) and 4 randomly assigned digits.

There are two codes that you can use immediately without having to create a user account.
TRAIØØ86: used for training (password: TRAIØØ86)
DEMOØØ32: used for demonstration (password: DEMOØØ32)
Hint: Copy the code (ctrl-C) and paste it (ctrl-V) into the password field

All data from tests performed under either of these codes will not be saved when you exit the E-A-Rfit software.

Password

Type the password that you entered when you created your user account. Should you wish to modify this password once you have logged in, click on the “Option” button at the top of the screen and select the “Change Password” tab.

Log to the E-A-Rfit Software

Once you typed your Technician Code and Password successfully, the “Log to E-A-Rfit™” button will be enabled and by pressing it you will taken to the “Welcome” screen.

Version

Always ensure that you are using the most recent version of E-A-Rfit™ software. Each user will be advised by email when updates are available and will be able to download the latest version on the E-A-Rfit User Support website: http://earfit.3m.com . Please check the website regularly for updates & announcements.

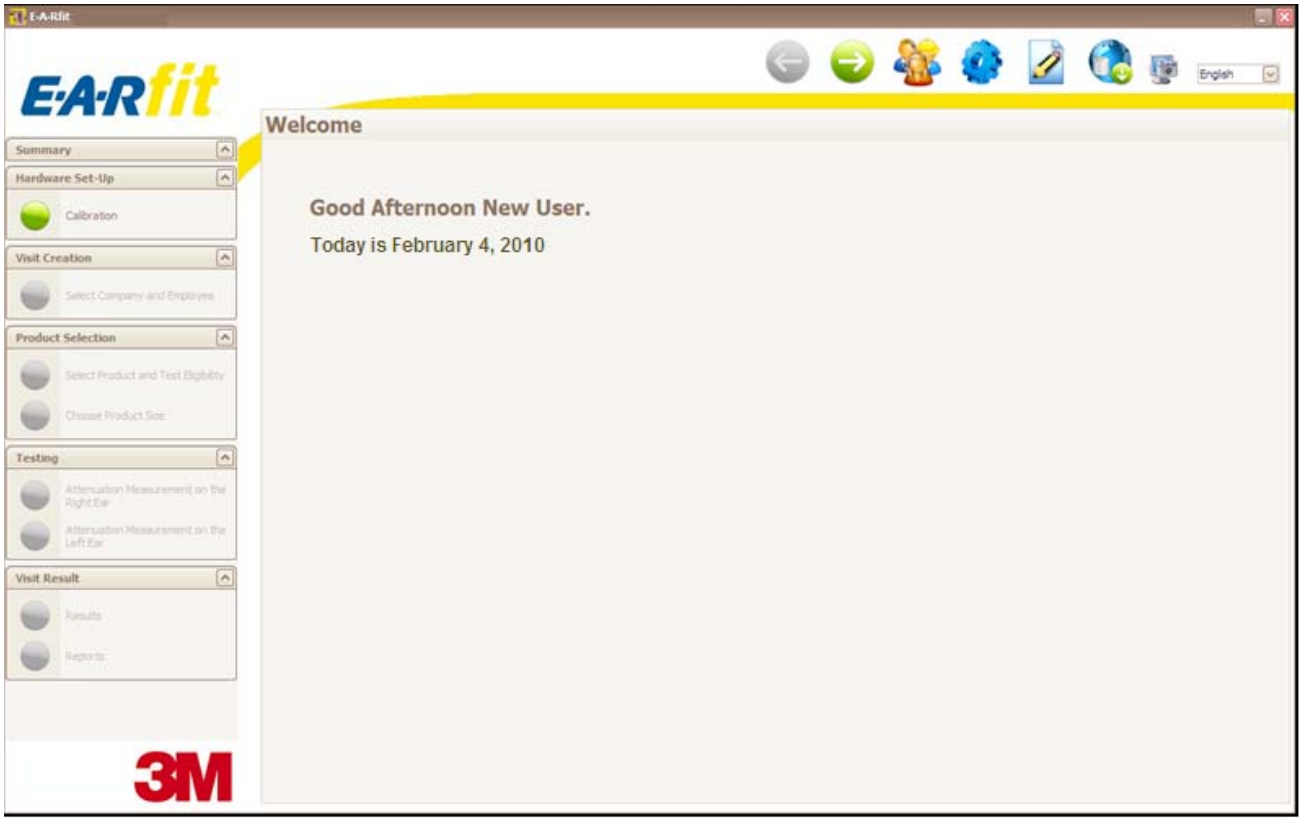
Create User Account

After you register on the E-A-Rfit User Support website, you will be issued a Technician Code and Password to create your account within the software.

Before you log in to the E-A-Rfit software, you will need to create a user account. In order to proceed, you must be connected to the internet and have your hardware (speaker) connected to your computer. This step is only required once on your computer per user unless you wish to use the software on a different computer.

Please refer to the E-A-Rfit 4.1 Installation Guide (Full) for more information about this process.

Welcome Screen



Navigation

Navigation through the software can be done by:

1. Using the navigation arrow buttons at the top right-hand side of the screen; OR
2. Selecting the desired function directly by clicking on the appropriate button in the navigation window on the left side of the screen

Top Right-Hand Menu

Left Arrow: Leads you to the previous step in the software navigation

Right Arrow: Leads you to the next step in the software navigation

Employee Manager: Click here to add a company and add employees. (See page 27 for details)

Options: Click here to change your password or your technician contact information. (See page 27 for details)

Report Manager: Click here to generate your saved reports. (See page 29 for details)

Synchronization: Click here if you wish to synchronize your data (*optional*, see page 35 for details)

Screen Capture: Click here to take a screen capture. (See page 35 for details)

Language: Click on the drop-down menu to change the language. (See page 35 for details)

Left Side Menu

The Left menu will guide you through the software. As tasks are completed, a check mark appears within the green circle.

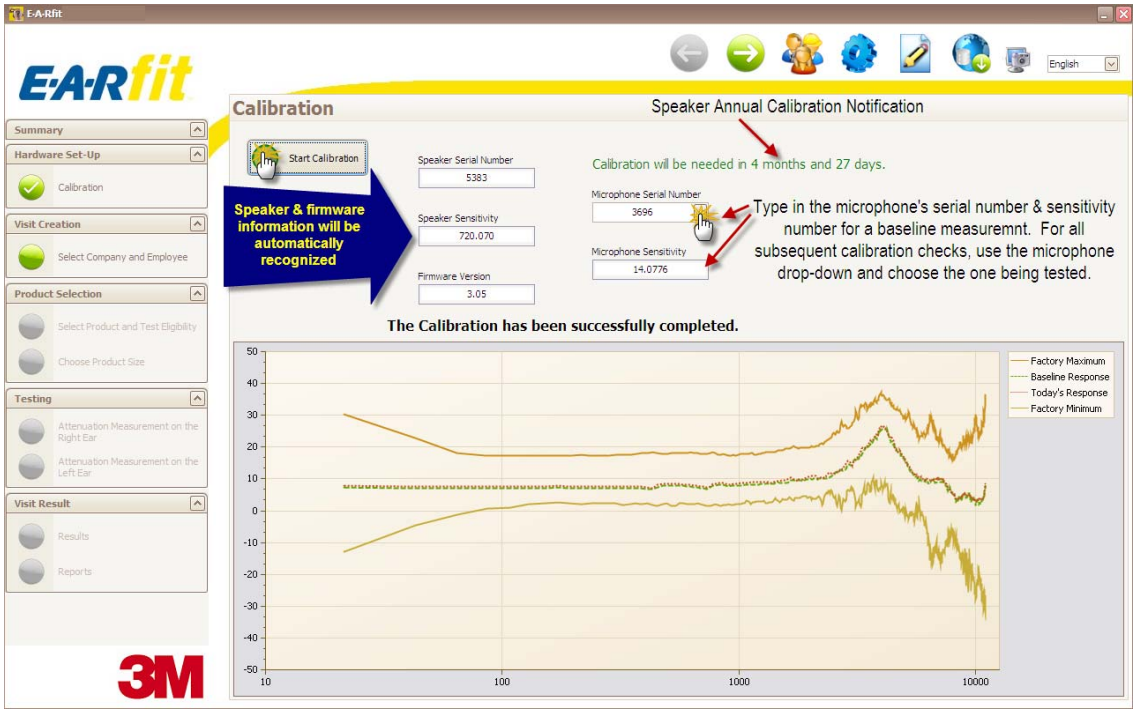
1. Summary
   a. Displays the Company and Employee being tested once the visit has been created.
2. Hardware Set-Up
   a. Calibration: The microphone and speaker need a calibration check before testing can be done.
3. Visit Creation
   a. Select Company and Employee: Enter demographic information for a company and their employees as well as applying exposure level tables and audiograms within the employee record.
4. Product Selection
   a. Select Product and Test Eligibility: Select product to be tested and complete an eligibility questionnaire.
   b. Choose Product Size: Product size can be chosen if applicable
5. Testing
   a. Attenuation Measurement of the Right/Left Ear: Attenuation measurements are conducted and results are displayed.
6. Visit Result
   a. Results: All results are displayed
   b. Report: Standard report for reviewing, printing, saving, and validating

Summary

The “Summary” box provides important information accessible at all stages of the software except at the “Attenuation Measurement” screens

Hardware Set-Up

Calibration



Speaker serial number, sensitivity and firmware version will be automatically detected by the software. The software will also detect when your speaker is due for its annual calibration. The “calibration due date” message will change from green to yellow to red depending on how close you are to the calibration due date.

You will need to enter the microphone serial number and sensitivity, or select the serial number from the drop-down menu. The software will retain serial numbers and sensitivities (unless updated) in its database for all microphones used with a dedicated hardware (speaker).

Four curves will appear on the calibration graph:

1. Factory Maximum (Yellow): Established by a 3M calibration technician.
2. Baseline Response (Green dashes): When a particular microphone is being checked for the first time, its response will be saved as its Baseline for future reference.
3. Today's Response (Red dots): This is the current and last response curve for your microphone
4. Factory Minimum (Yellow): Established by a 3M calibration technician.

The entire "Baseline Response" curve must be between the Factory Maximum and Factory Minimum curves to be a successful calibration check. "Today's Response" will be compared to this "Baseline Response". The calibration check must be successful in order to proceed and test the hearing protectors.

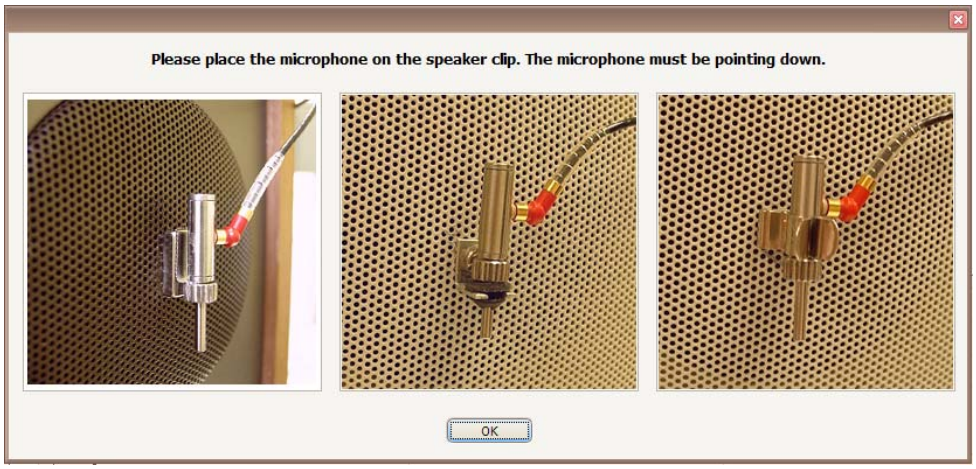
Check to ensure all the equipment is well connected if the calibration check is not successful. The software will not allow you to proceed further. After three consecutive failed attempts, the software will automatically close.

You may check the calibration again anytime while in the E-A-Rfit software.

Baseline Measurements

WARNING! You are registering a new microphone for the current hardware. The calibration response will be stored as its baseline response.
OK

Pop-up #1 will arise prior to the first baseline response calibration check to stress the importance of this measurement. This message will not occur on subsequent calibration checks.

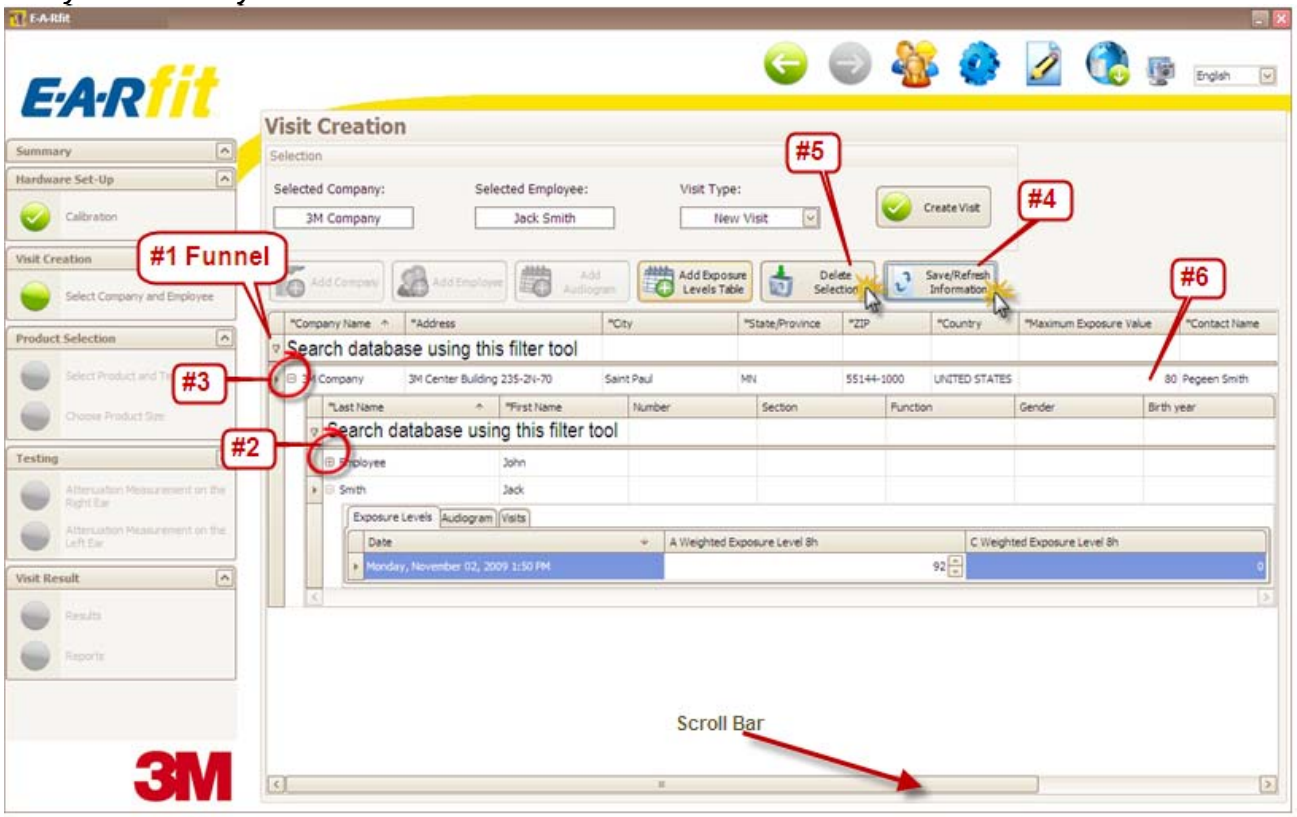


Pop-up #2 displays the proper positioning of the microphone for the calibration check depending on the various speaker clips available. This message will not occur on subsequent calibration checks.

Visit Creation

Select Company and Employee

It may be necessary to use the scroll bar at the bottom of the screen in order to see all of the fields.

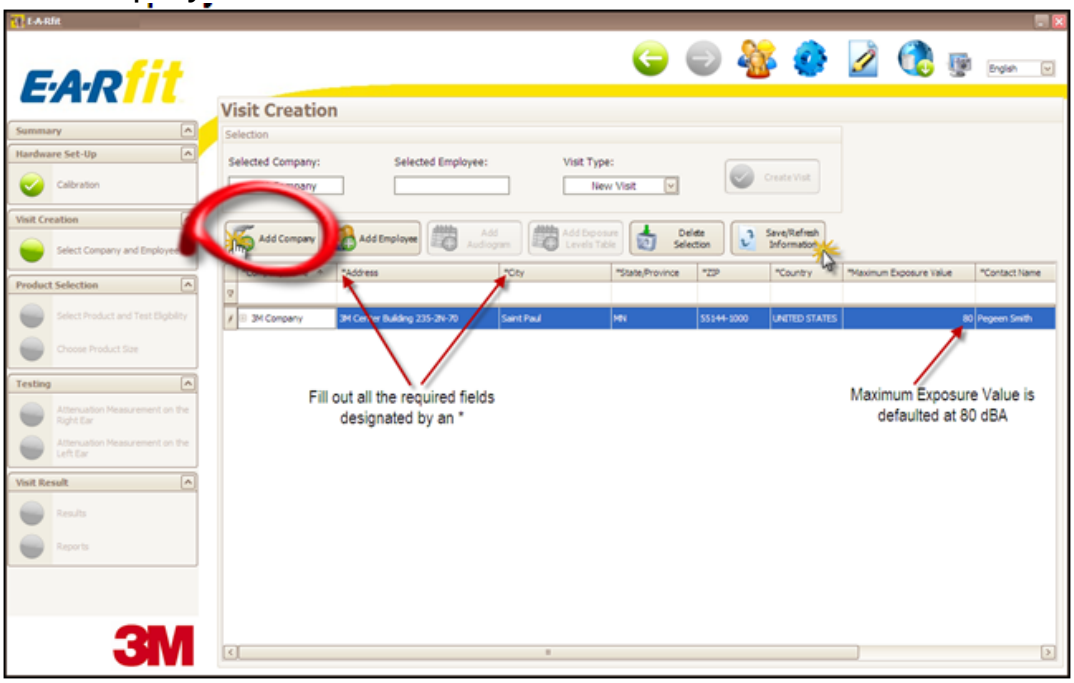


Here is a list of actions you can perform on this screen.

1. Search for a Company/Employee: The top line (with a funnel on the left) enables you to launch a search. Enter the search criteria in any of the fields to select the company or employee you wish to test.
2. View details: The "+" sign next to Company/Employee, indicates that more information will be displayed when it is clicked. Clicking on the "+" sign will expand the database.
3. Hide details: The "-" sign next to Company/Employee indicates that all sub-windows have been opened for that selection. Information can be hidden by clicking on the "-" sign.
4. Save/Refresh information: Always click on this button once new information is entered.
5. Delete Selection: You can only delete an "Employee" or "Company" from the list if there are no test data associated with them. To proceed, select the "Company/Employee" and click "Delete Selection".
6. Modify Selection: You can modify "Company/Employee" information at any time. Insert the cursor in the field you wish to modify and type.

Recall that you may have to use the vertical scroll bar at the right of the screen in order to view all of the information.

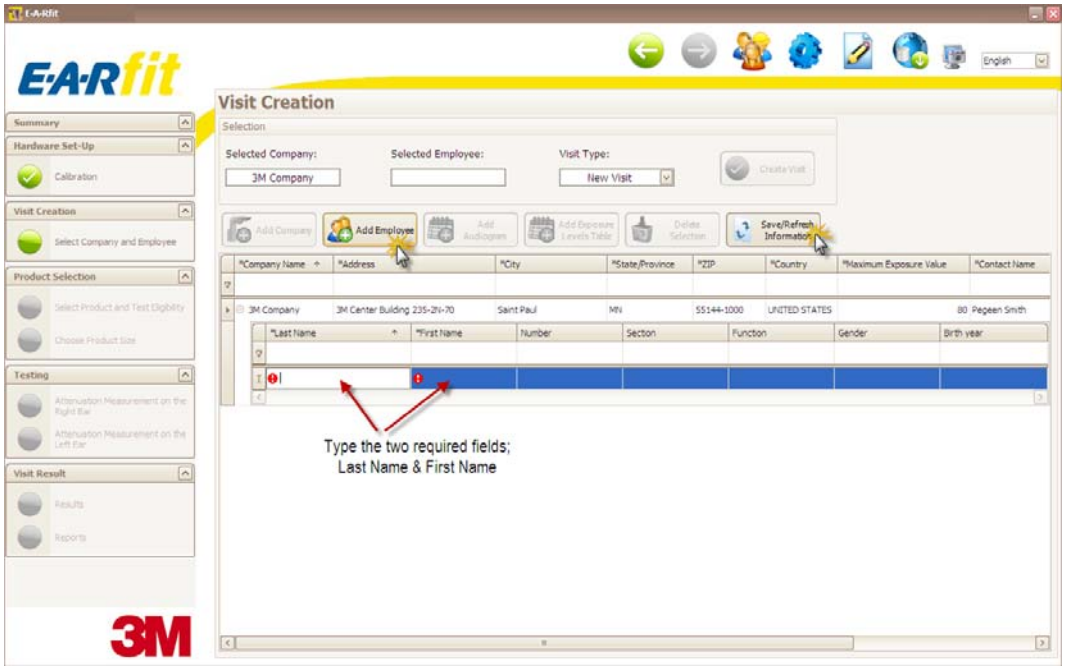
Add Company



Click on "Add Company" to create a new company. All required fields have an asterisk* and a red circle with an exclamation point is present where information is to be entered. Click "Save/Refresh Information" when all required information has been inserted.

Maximum Exposure Value: By default the Maximum Exposure Value is set to 80 dB. The default level may be modified if, for example, legislation in your region differs from this or if the company you are testing prefers to change it.

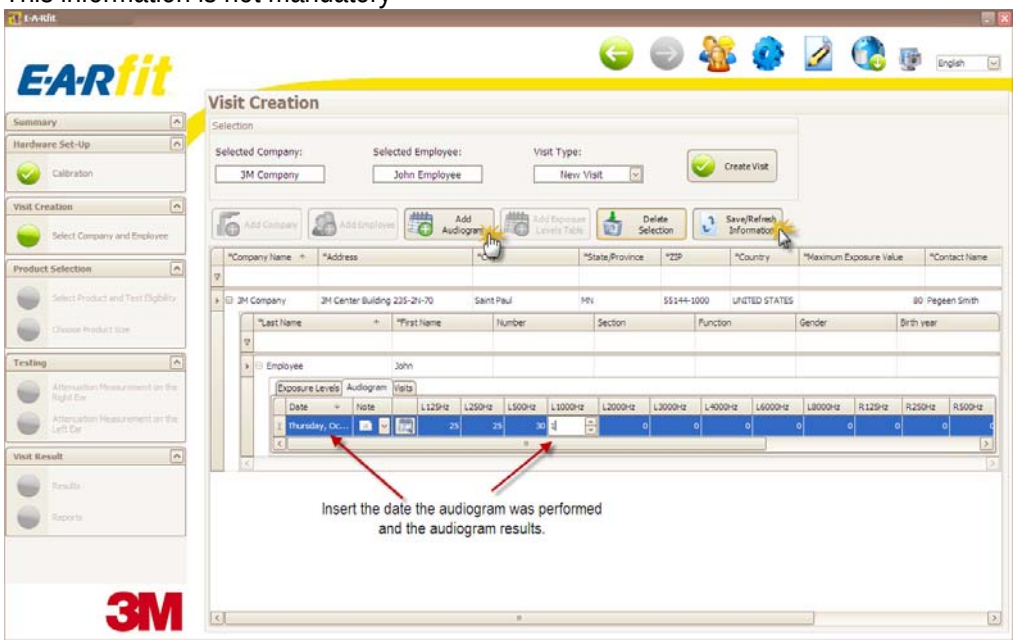
Add Employee



Click on “Add Employee” to create a new employee. All required fields have an asterisk* and a red circle with an exclamation point is present when information is missing. Click “Save/Refresh Information” when all required information has been inserted

Add Audiogram

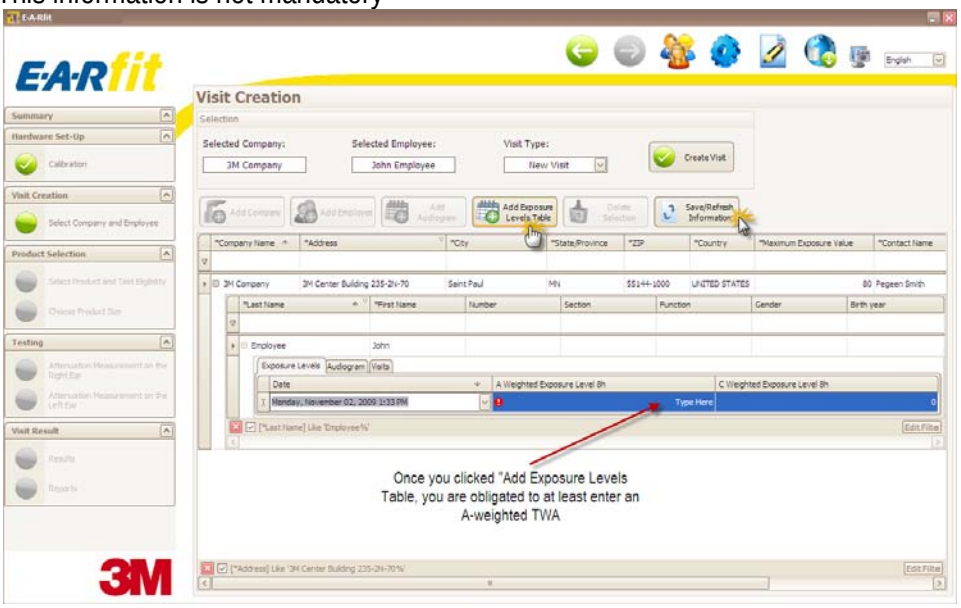
This information is not mandatory



Audiometric data for an employee may be entered here. Select the date (mandatory field) at which the test was conducted and enter the results per ear and per frequency. Example: L125Hz = threshold level at 125 Hz for the left ear. R1000Hz = threshold level at 1000 Hz for the right ear.

Add Exposure Level Table

This information is not mandatory

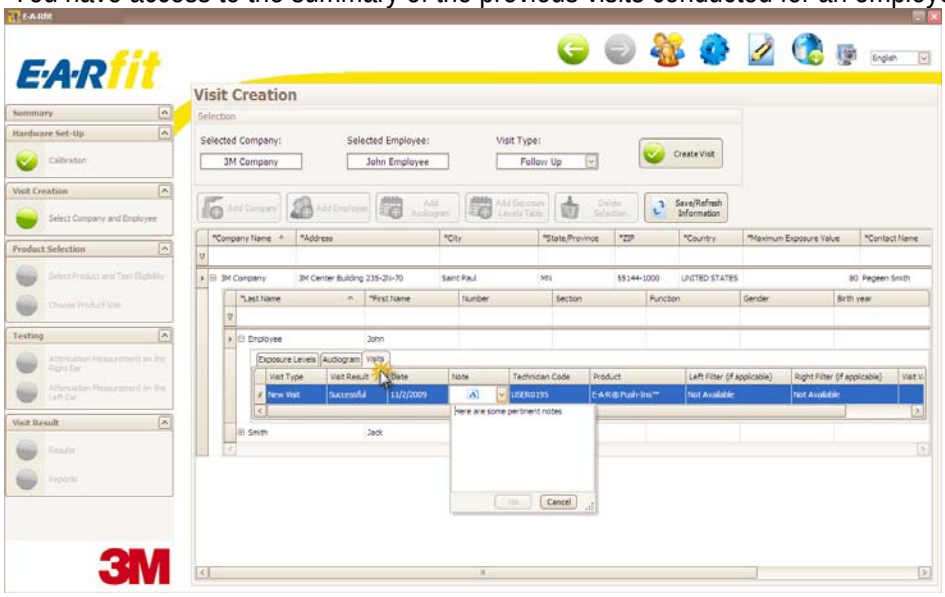


The current date will be selected by default in the “Date” field. Once this button is pressed, the A-weighted value is mandatory but the C-weighted value is not. However, adding a C-weighted value will calculate the exact noise spectral balance (C-A) value on the Graphical PAR and Protected Level graphs in the form of a vertical line.

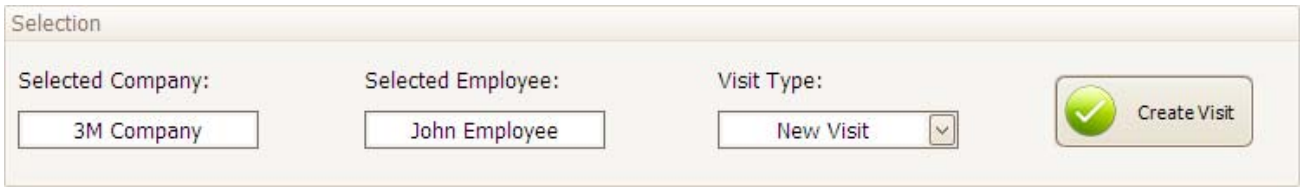
During a “Follow-Up” visit, the calculations will be based on the last exposure level entered in the employee data file. To verify the last exposure level, click on the (+) sign beside the employee name to view the tabbed screen. To MODIFY the exposure level for your current visit, click on “Add Exposure Level” and enter your A-weighted and/or C-weighted data. In the event that the employee's exposure is unknown, add 0 (zero). The exposure level will not be used in the calculations for this and subsequent visits.

Visits Tab

You have access to the summary of the previous visits conducted for an employee.



Selection



Selected Company

Before proceeding, you must select the name of the company. Once selected, the name will appear in the “Selected Company” field at the top of the screen.

Selected Employee

Once the Company is selected, press the (+) sign in front of the company name to view the list of employees. Select the name of the employee that is to be tested. Once selected, the name will appear in the “Selected Employee” field at the top of the screen.

Visit Type

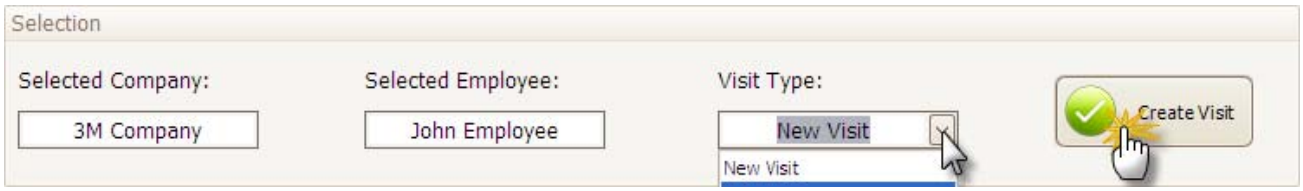
Now that the “Company” and the “Employee” are selected, choose the “Visit Type”

- New Visit: Will appear by default for a new employee that has never been tested. Select this if you are testing a new type of hearing protectors for the first time for this employee.

- Follow-up: Will appear by default if you select an employee that you have tested in the past.

You may choose to override the selected default visit type depending on the circumstance.

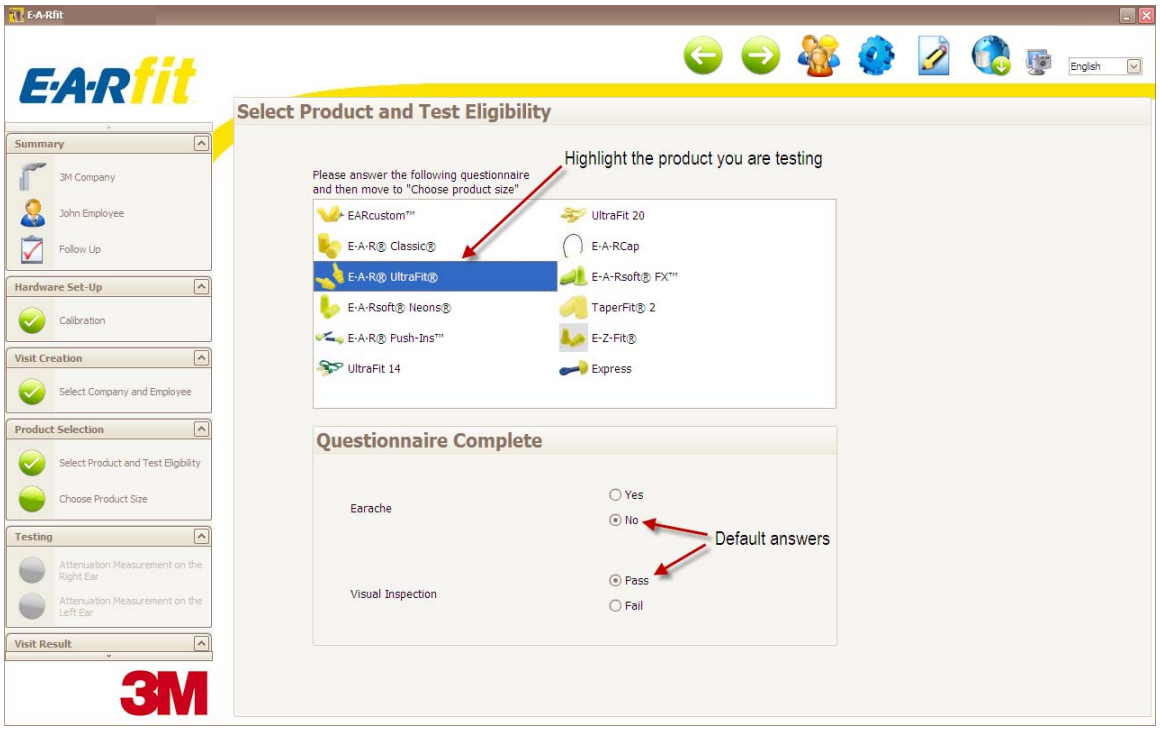
Create Visit



Click “Create Visit” and you will be brought automatically to the Product Selection screen

Product Selection

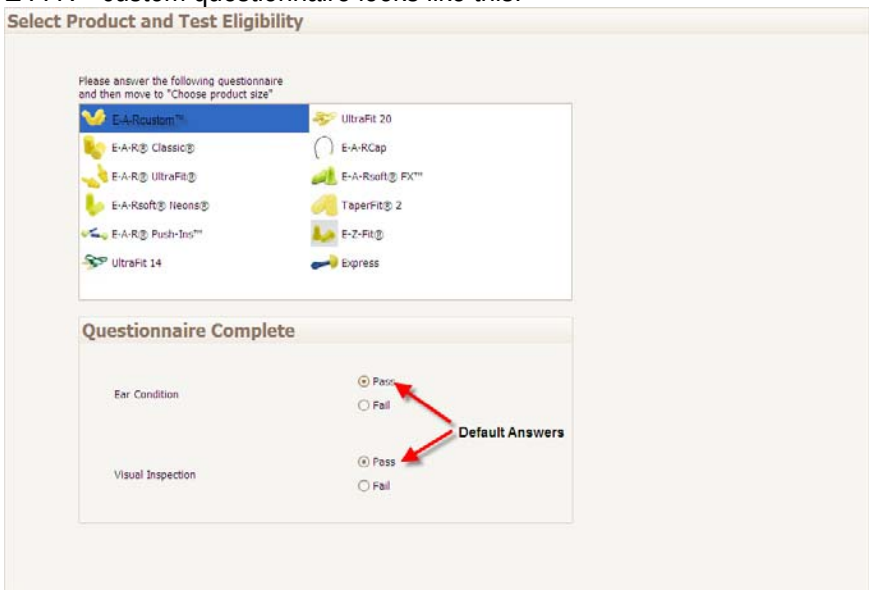
Select Product



Test Eligibility

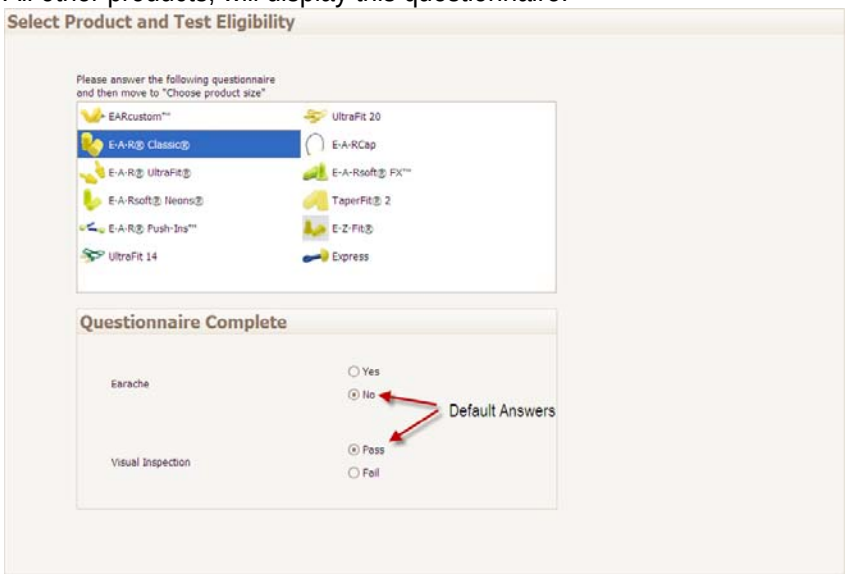
The two questions in the questionnaire must be answered in order to proceed. Questionnaires vary depending on the product chosen.

E-A-R™custom questionnaire looks like this:



Click on the “Fail” button for “Ear Condition” and/or “Visual Inspection” if the employee has ever had a history of a Mastoidectomy, has had ear surgery within the last 12 months, has signs or symptoms of an ear infection, has excessive wax in the earcanal, has a perforation of their tympanic membrane, or any sensitivity in their ear.

All other products, will display this questionnaire:

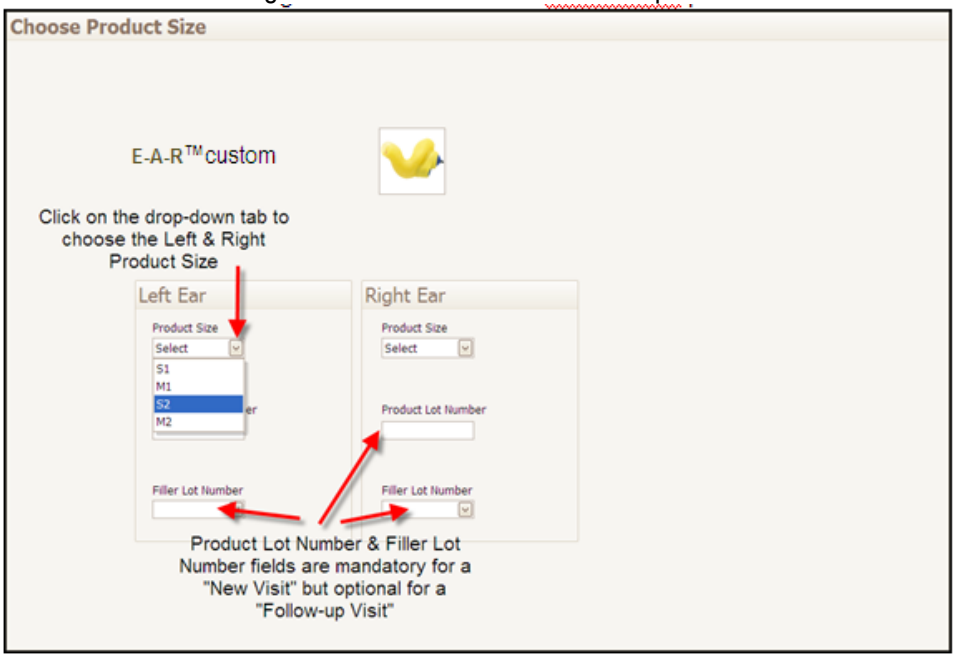


If the employee has an earache at the time of testing, click “Yes”. Chose “Fail” for the “Visual Inspection” if you performed an otoscope inspection (optional) and saw signs of infection or excessive wax that you believe will interfere with the test. If either “Yes” and/or “Fail” are ticked, the employee will not be eligible to be tested. Clicking the forward arrow button at the top of the screen will bring you directly to the “Report” screen.

Choose Product Size

If you choose a product that is available in multiple sizes, you will be brought to the “Choose Product Size” screen. Otherwise, you will be brought directly to the “Attenuation Measurement screen for the Right Ear”
The screen for choosing the size of non-custom plugs looks like this:

The screen for choosing the size for the E-A-R™custom product looks like this:

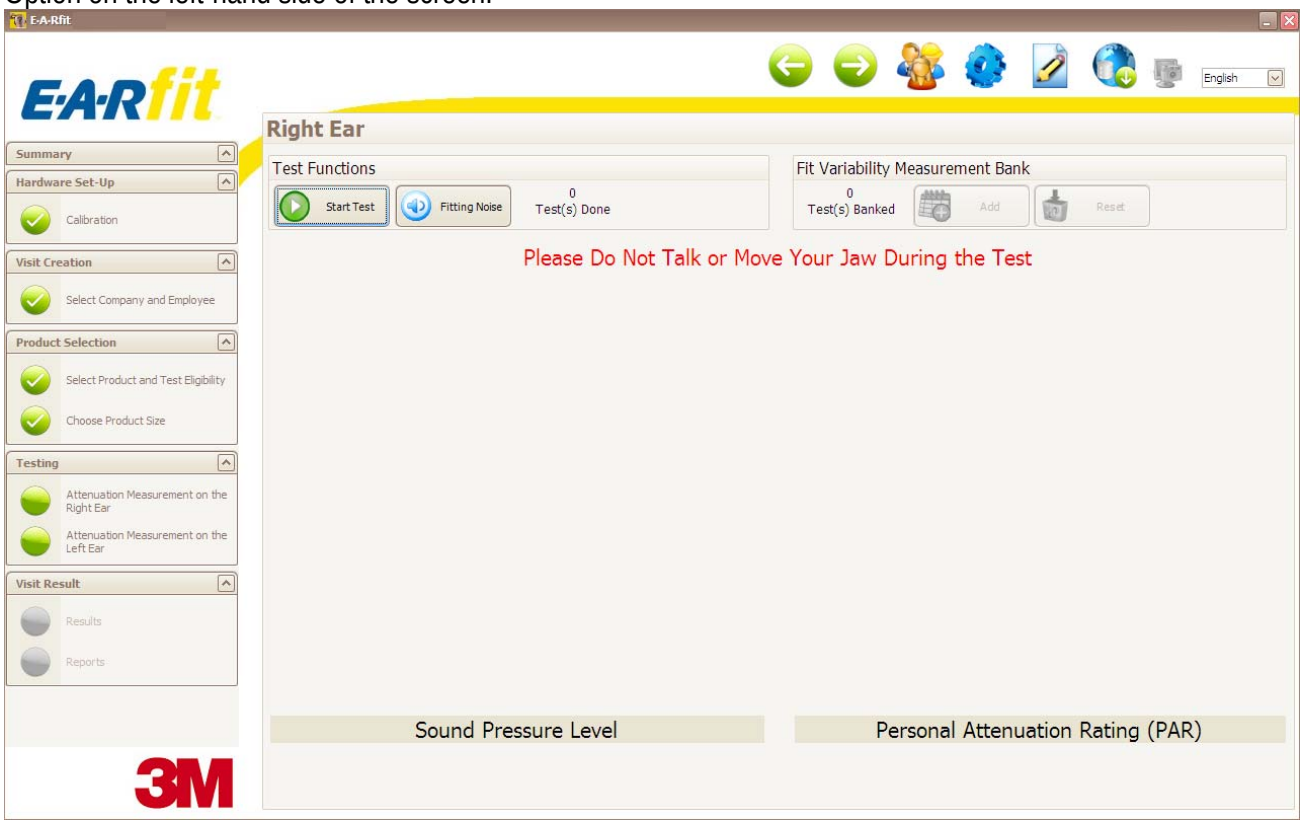


First, click on the drop-down tab to choose the left and right product size. Insert the Product Lot Number for the E-A-R™custom (label on product bag) into the fields. Insert the Filler Lot Number (label on silicone cartridge) in the field. Product andFiller lot codes are mandatory if this is a “New Visit” and optional for a “Follow-up Visit.”

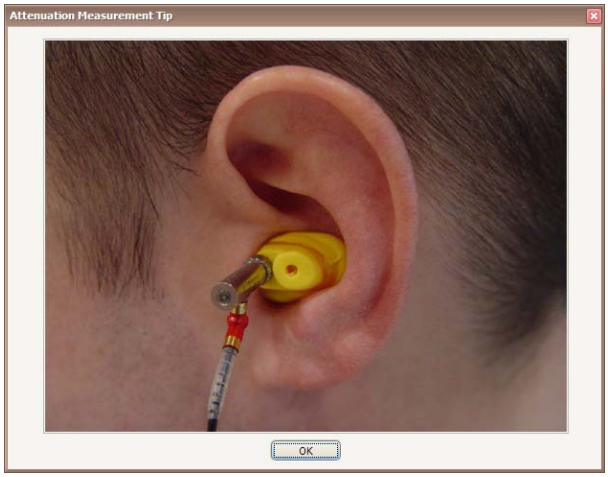
The E-A-R™custom chosen for left and right ear can be different sizes but must be of the same generation (Generation 1 vs. Generation 2).

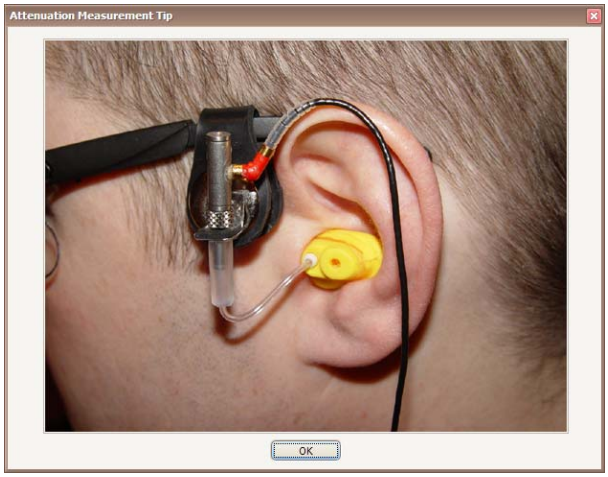
Testing

Attenuation Measurements occur at this screen. The software automatically begins at the Right Ear for testing but you may choose to test the Left Ear first by clicking on the "Attenuation Measurement on the Left Ear." Option on the left-hand side of the screen.



If E-A-R™custom is being tested, you will receive one of these pop-ups before you can test which will illustrate how the microphone is set-up for testing depending on the generation of the product. Please assure that your set-up mirrors this set-up before proceeding with testing of the E-A-R™custom product.

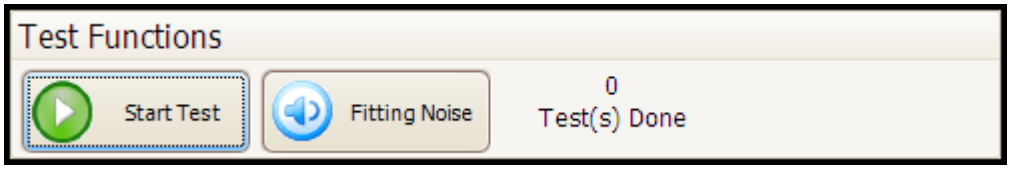




S1/M1 set-up

S2/M2 set-up

Test Functions



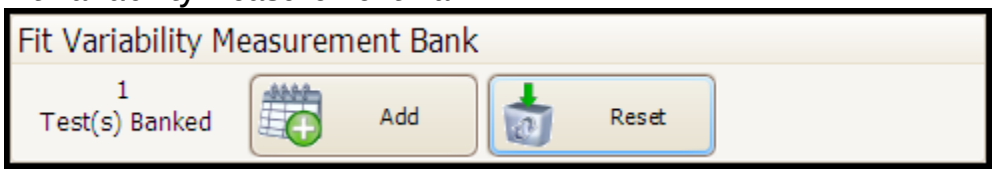
Start Test: The test begins as soon as you click the "Start Test" button.

A short amount of noise will be heard, during which the system will evaluate the quality of the measurement response. The noise will pause then the testing noise will begin and will automatically stop once the measurement is completed. At times, the testing noise may appear longer and louder. The system will automatically boost the noise, if needed.

Fitting Noise:
The Fitting Noise can be used as a teaching tool to learn how to fit an earplug properly by performing a "loudness test" after a HPD is fit into the employee's ears. To start the noise, click on the button; to stop the noise, click the button again.

Number Test(s) Done: This will tally the number of tests conducted for each ear.

Fit Variability Measurement Bank



Number Test(s) Banked: This will tally the number of tests saved or "banked" to be used in the calculations for each ear.

Add: After each measurement is conducted, you may click the "Add" button or "save" the results in the bank.
Reset: If for any reason you wish to clear the bank of all the measurements for this individual, click "Reset" and the bank will be returned to zero.

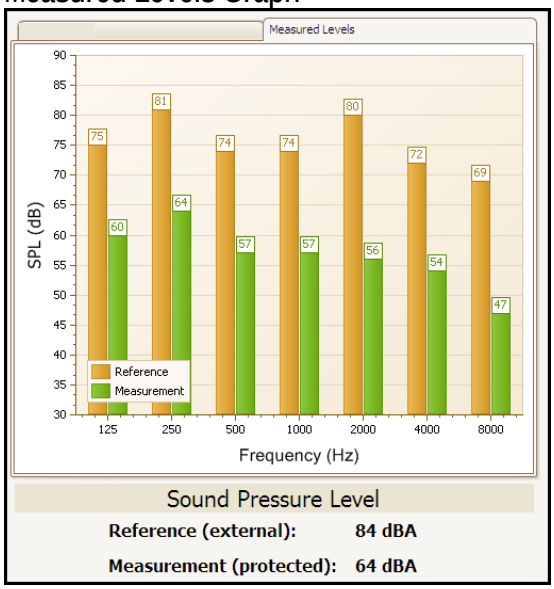
You must bank at least one measurement per ear in order have access to the “Results” screen. The more tests added to the bank after removing, refitting, and retesting the probed plug, the more precise the results will be for they will account for the variability of the employee’s fit. You will need to bank at least four tests for each ear in order to calculate the “Individual Variability”. Please refer to the “Fitting Profile” section of the “Visit Results” for more detail.

If you have not banked any tests, you will see replacing the “Attenuation Measurement” green circle on the left navigation window

Attenuation Measurement

At the completion of the test for each ear, the results are displayed on this screen. You will have the option to bank or “Add” the test to the “Fit Variability Measurement Bank” before continuing. This bank is specific to this test subject.

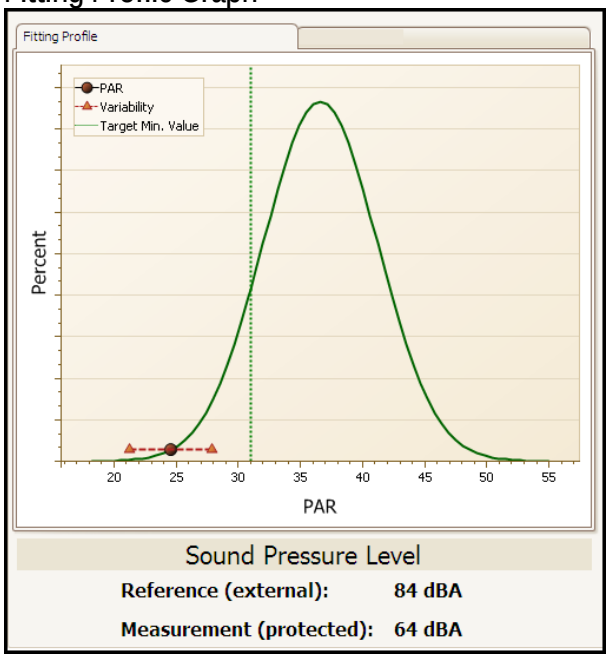
Measured Levels Graph



The **Measured Levels** graph displays the sound pressure levels measured by the reference microphone (yellow bars) and the measurement microphone (green bars) per octave band.

The overall results are displayed below the graph.

Fitting Profile Graph



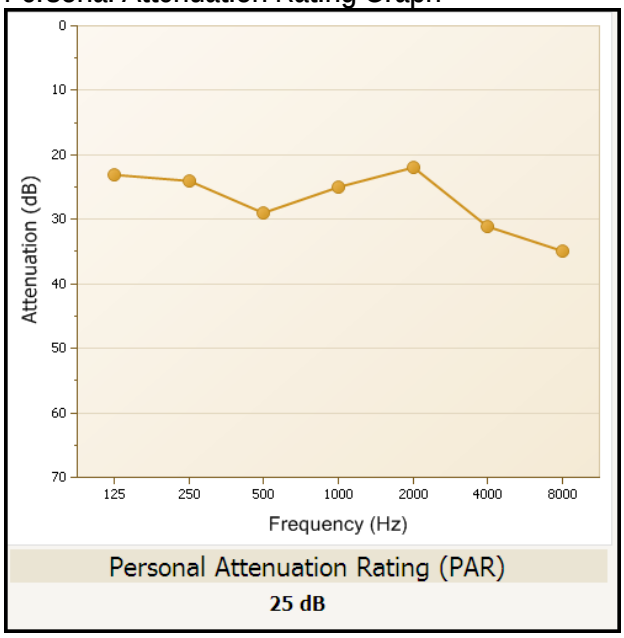
The **Fitting Profile** graph depicts the individual's personal attenuation rating (PAR) superimposed on a standard bell-shaped distribution curve.

The green vertical line (Target Minimum Value) is the 90th percentile mark. 90% of the subjects tested in the laboratory achieved the PAR value or higher.

The red dot represents the PAR value of the last test conducted.

The red line intersecting the PAR illustrates the range of variability associated with this measurement.

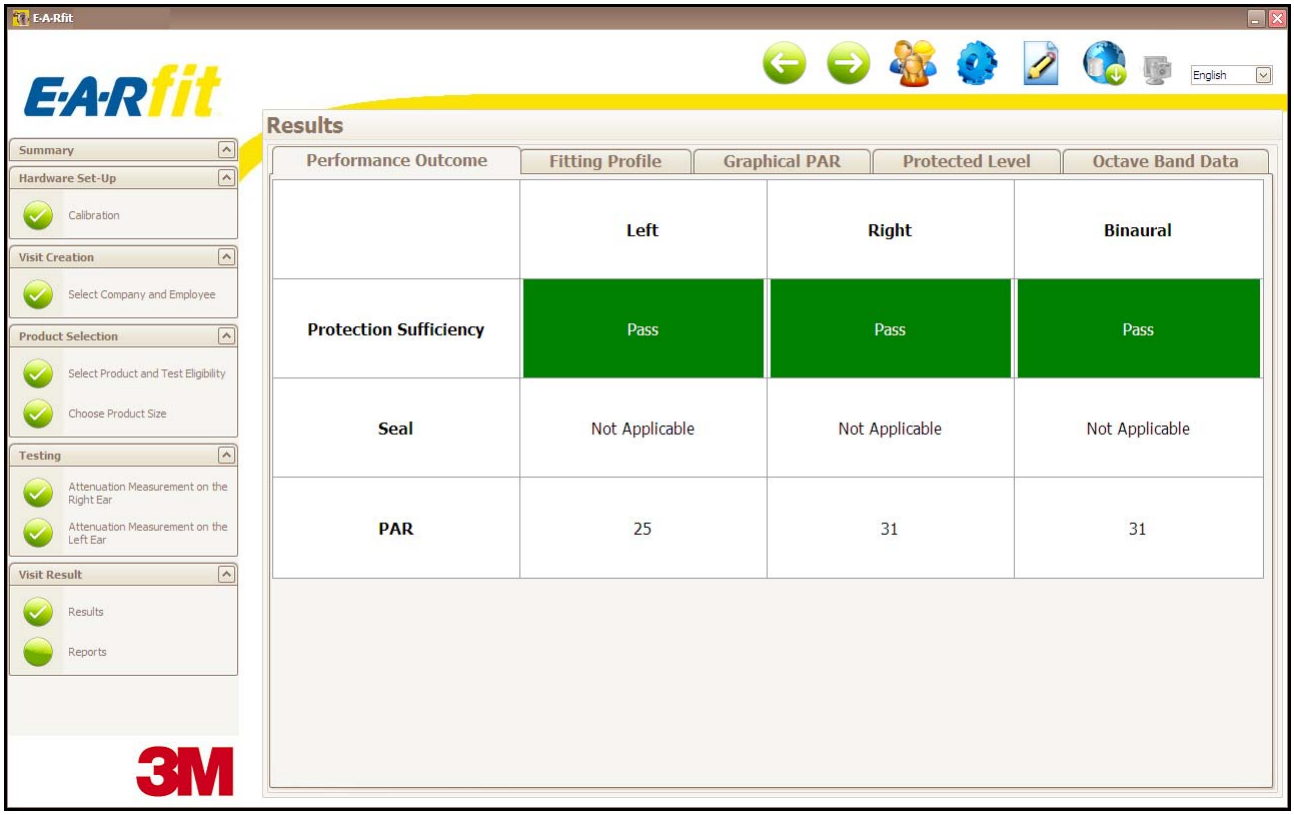
Personal Attenuation Rating Graph



The Personal Attenuation Rating Graph displays the PAR values for the seven octave bands. The overall PAR is computed and displayed at the bottom of the graph. The PAR can be directly subtracted from the employee's 8 hour TWA exposure level to determine their protected level of exposure.

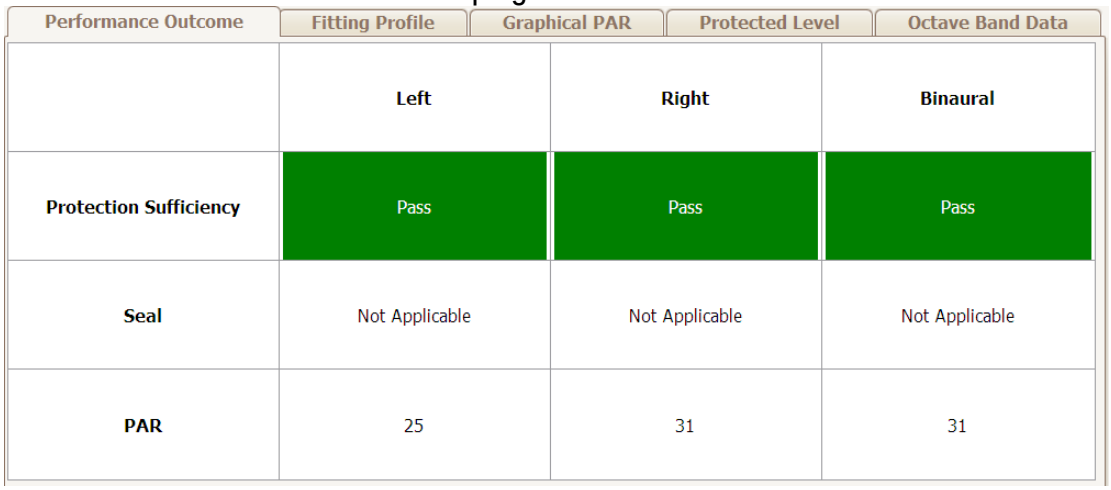
Visit Results

The "Results" screen compiles all the test data and displays the results on several result tabs.



Performance Outcome

Performance Outcome – non-custom plugs



	Left	Right	Binaural
Protection Sufficiency	Pass	Pass	Pass
Seal	Not Applicable	Not Applicable	Not Applicable
PAR	25	31	31

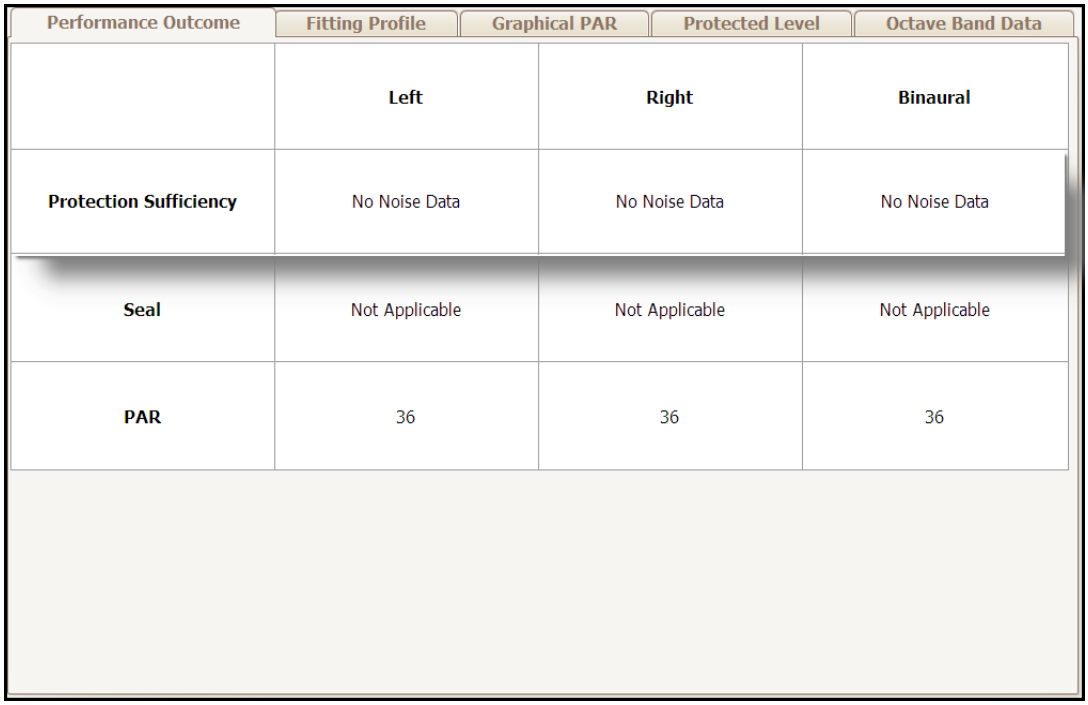
The first tab on the Results screen displays the Performance Outcome.

Protection Sufficiency – This criteria of performance displays if an exposure level is added to the employee's record. A green display (Pass) indicates that the PAR value even with the uncertainty factor subtracted is above the Target Minimum Attenuation for this employee. A red display (Fail) indicates that the PAR value and its uncertainty either intersects or is below the Target Minimum Attenuation for this employee.

PAR – The overall PAR values for Left, Right, & Binaural are displayed.

NOTE: Protection Sufficiency determinations are based upon the data entered by the Technician (i.e., TWA) and the test results for this employee during these testing sessions.

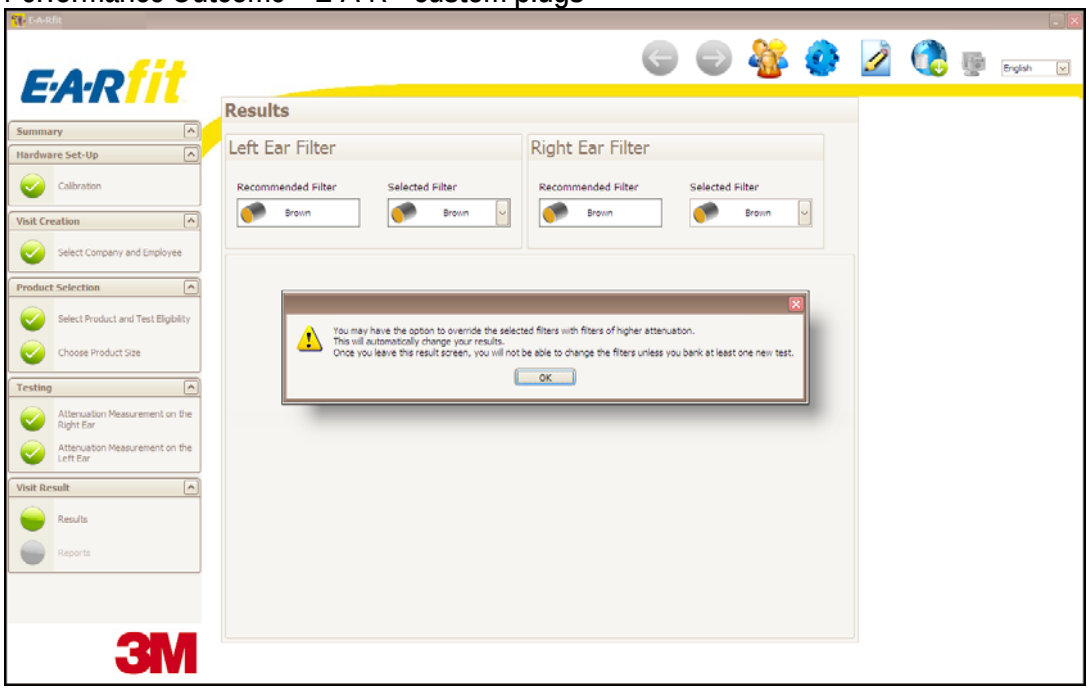
Performance Outcome – No Noise Data



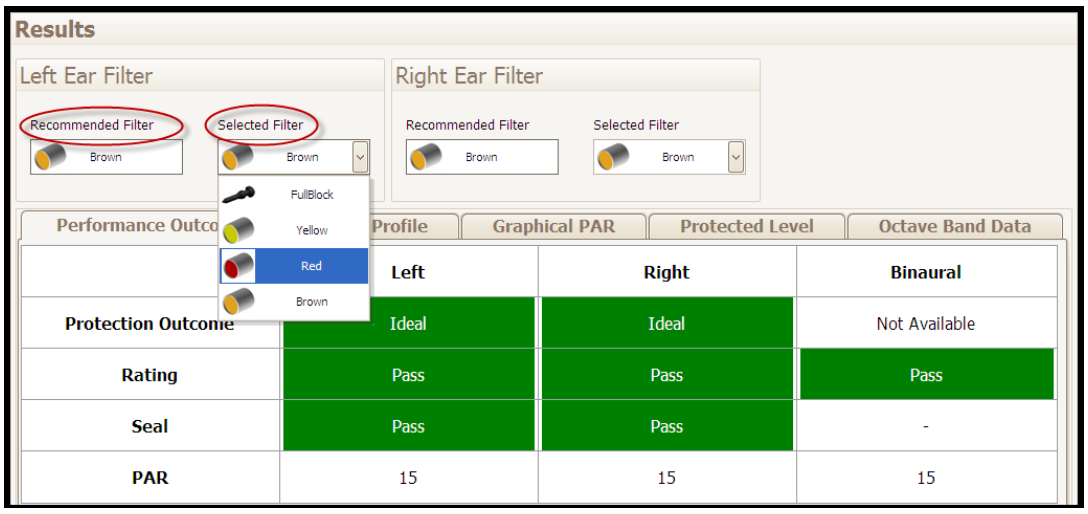
	Left	Right	Binaural
Protection Sufficiency	No Noise Data	No Noise Data	No Noise Data
Seal	Not Applicable	Not Applicable	Not Applicable
PAR	36	36	36

If an exposure level has not been applied to an employee's record, the Protection Sufficiency results will not be calculated. This results in the message "No Noise Data".

Performance Outcome – E-A-R™custom plugs



When testing E-A-R™custom and if an exposure value is entered in the employee record, the software will guide you in filter selection.



Recommended Filter: If an exposure level is added to the employee record, the E-A-Rfit™ software will recommend the filter that provides a protected exposure level that is between 75 and 80 dB, which corresponds to an Ideal, "Protection Outcome."

Selected Filter: The "Selected Filter" drop-down menu enables you to override the software filter recommendation. You may choose to select filters of attenuation higher than what is recommended by clicking on the drop-down for each ear. The Protection Outcome and PAR will be adjusted.

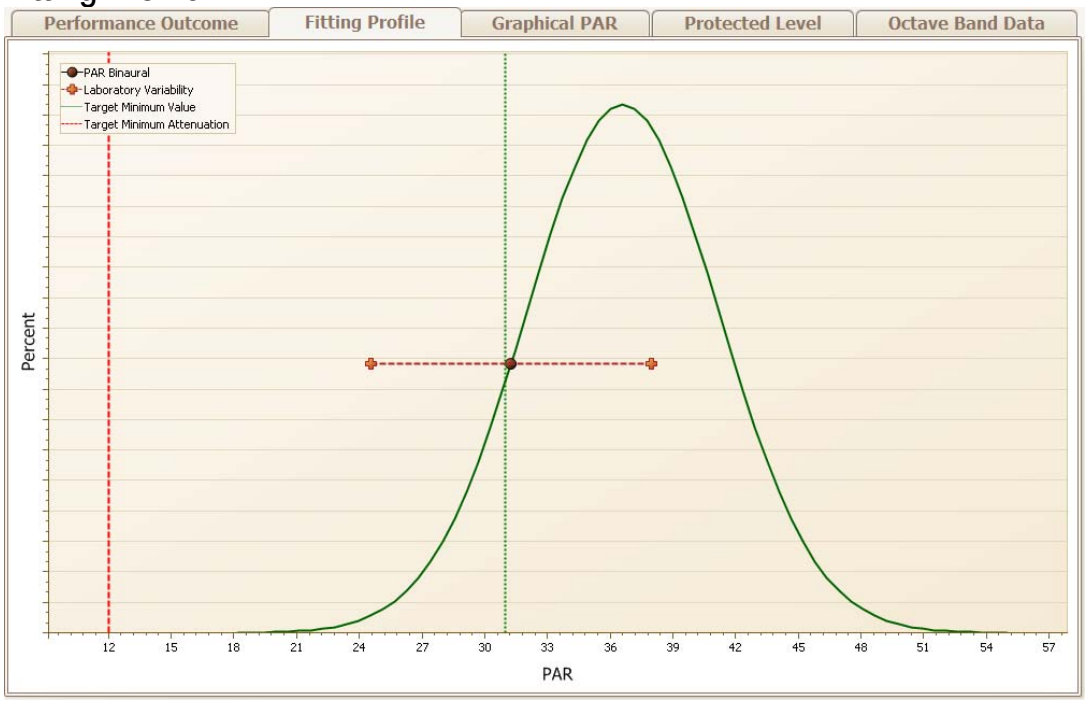
Protection Outcome uses the approach embodied in the European Standard (EN 458[1]) and Canadian Standard (CSA Z94.2-2002) and as a performance criteria for the E-A-R™custom. The indicator lights will be either green for "Ideal", yellow for "Acceptable" or red for "Over-Protection" or "Under-Protection". Fit testing results may not necessarily reflect proper protection once the employee returns to work.

The Rating test is used to determine if the E-A-R™custom earplug with a full-block protection is measuring at least the NRR label for that plug. The light indicators will either be green ($PAR_{84\%}$) or yellow ($PAR_{50\%}$) for "Pass" and red for "Fail". The Rating test may not be calculated for countries where legislation does not have a "derating" rule applied to hearing protectors.

The Seal test is used to determine if the E-A-RCustom™ is achieving an acoustic seal. An acoustic seal is present if there is at least a 9 dB difference between the reference sound pressure level (SPL) measured by the external microphone and the measurement SPL measured by the internal microphone at 250 Hz. A green indicator light means there is an acoustic seal and a red indicator light is displayed when there is not an acoustic seal. If a red light appears, return to the "Attenuation Measurement" screen and have the employee refit the plug and retest. If the acoustic seal test continues to fail, remake the custom-molded product.

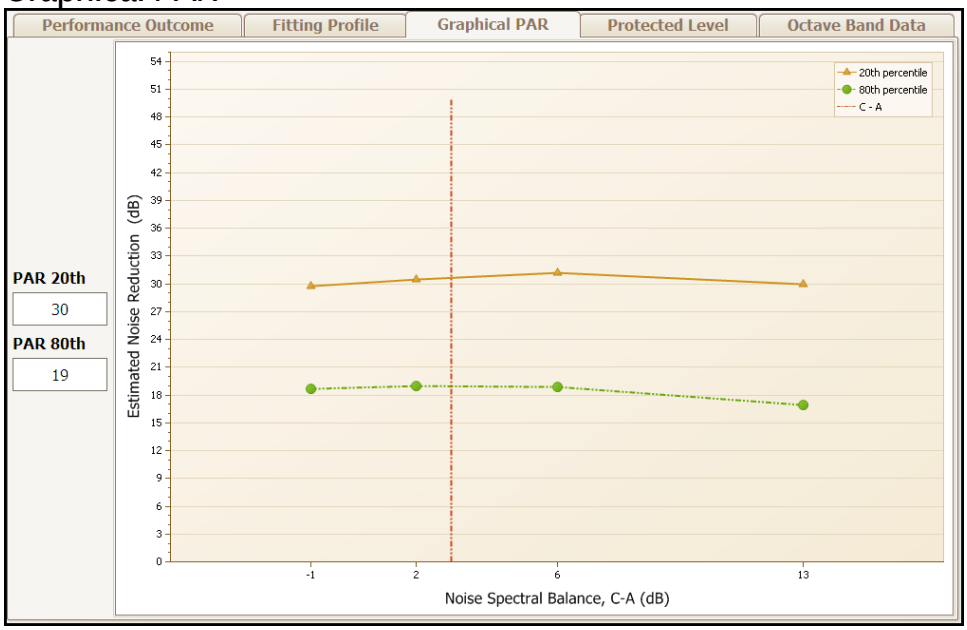
PAR – The overall PAR values for Left, Right, & Binaural are displayed.

Fitting Profile



The Fitting Profile graph is similar to the Fitting Profile graph at the Attenuation Measurement screen, except the PAR is binaural.
PAR Binaural (red dot) value represents the binaural measurement
Individual Variability (yellow horizontal line) appears if more than 4 tests are banked on each ear.
Laboratory Variability (red horizontal line) represents the range of variability associated with the measurement as determined by 3Ms EARCAL Laboratory.
Target Minimum Value (TMV, green vertical line) is the 90th percentile mark. 90% of the subjects tested in the laboratory achieved the PAR value or higher. This value is product specific.
Target Minimum Attenuation (TMA, red vertical line) represents the minimum attenuation required given the Maximum Exposure Value (MEV) for this company and the Time-Weighted Average (TWA) exposure value of this employee. (MEV – TWA = TMA). Remember that the default MEV is set at 80 dB. The MEV and TWA are company specific values based upon information that has been added to the record. Selection of earplugs can assist the company and user to provide the appropriate level of protection.

Graphical PAR

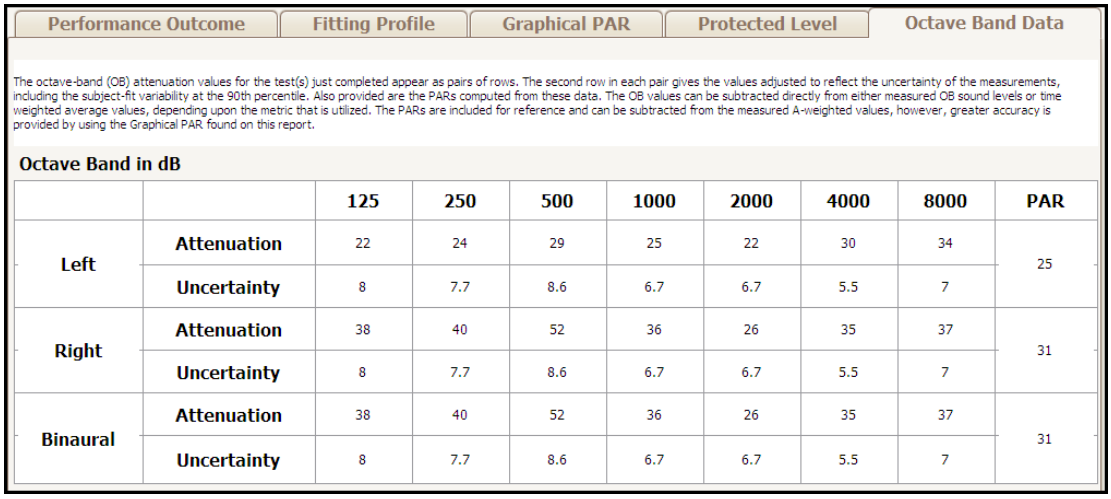


The Graphical PAR displays the estimated noise reduction as it pertains to the spectral balance of the noise for the 20th and 80th percentiles.
The red vertical line indicates the C-A value entered in the employee record. This line appears only if both exposure values (dBA and dBC) are entered into the employee record.

Protected Level

The Protected Level graph will have data to display if an exposure value is entered into the employee record. This graph illustrates the Estimated Protected Level given the spectral balance of the noise.
The red vertical line indicates the C-A value entered in the employee record. This line appears only if both exposure values (dBA and dBC) are entered into the employee record.

Octave Band Data



Performance Outcome | Fitting Profile | Graphical PAR | Protected Level | Octave Band Data

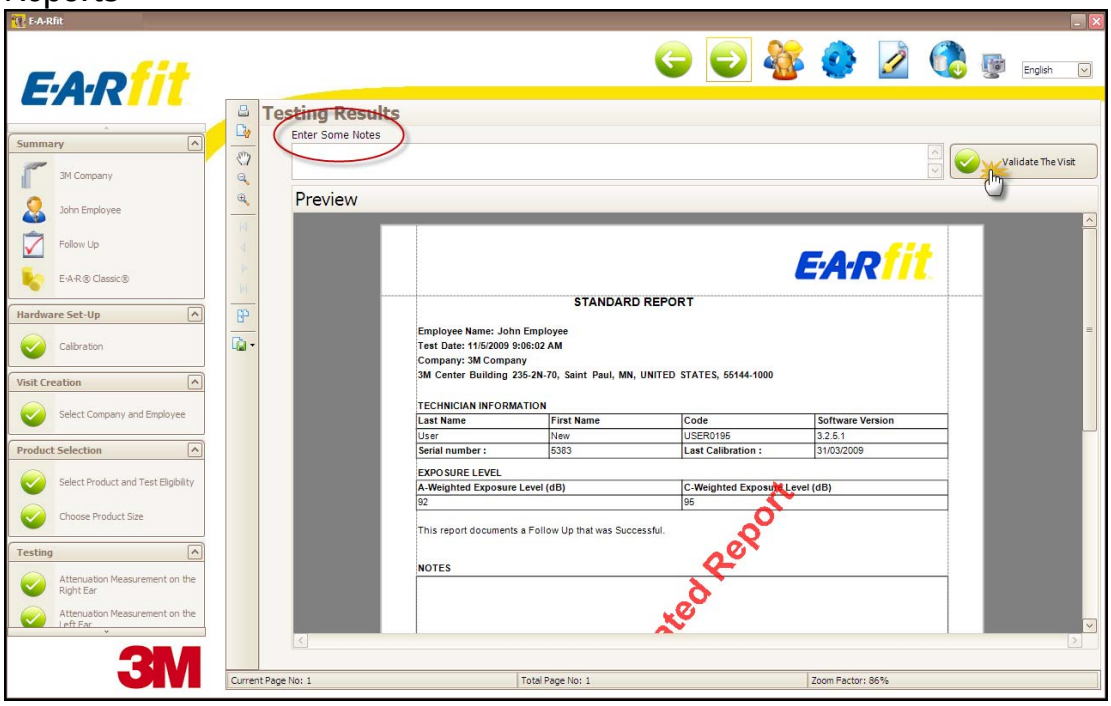
The octave-band (OB) attenuation values for the test(s) just completed appear as pairs of rows. The second row in each pair gives the values adjusted to reflect the uncertainty of the measurements, including the subject-fit variability at the 90th percentile. Also provided are the PARs computed from these data. The OB values can be subtracted directly from either measured OB sound levels or time weighted average values, depending upon the metric that is utilized. The PARs are included for reference and can be subtracted from the measured A-weighted values, however, greater accuracy is provided by using the Graphical PAR found on this report.

Octave Band in dB

		125	250	500	1000	2000	4000	8000	PAR
Left	Attenuation	22	24	29	25	22	30	34	25
	Uncertainty	8	7.7	8.6	6.7	6.7	5.5	7	
Right	Attenuation	38	40	52	36	26	35	37	31
	Uncertainty	8	7.7	8.6	6.7	6.7	5.5	7	
Binaural	Attenuation	38	40	52	36	26	35	37	31
	Uncertainty	8	7.7	8.6	6.7	6.7	5.5	7	

The Octave Band Data table displays the attenuation and uncertainty data at each octave band for the left ear, right ear, & binaural.

Reports

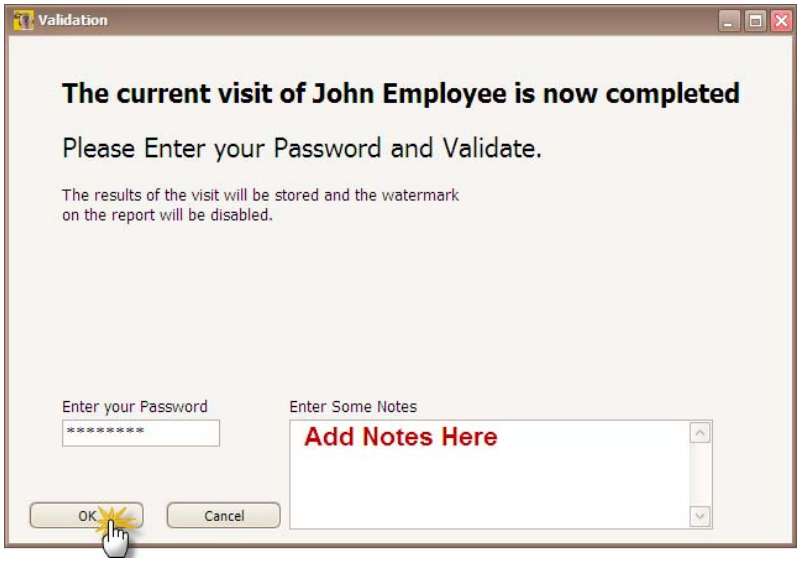


The standard report (one page) will appear at this screen. Use the scroll bar on the right side of the screen to view the entire report.

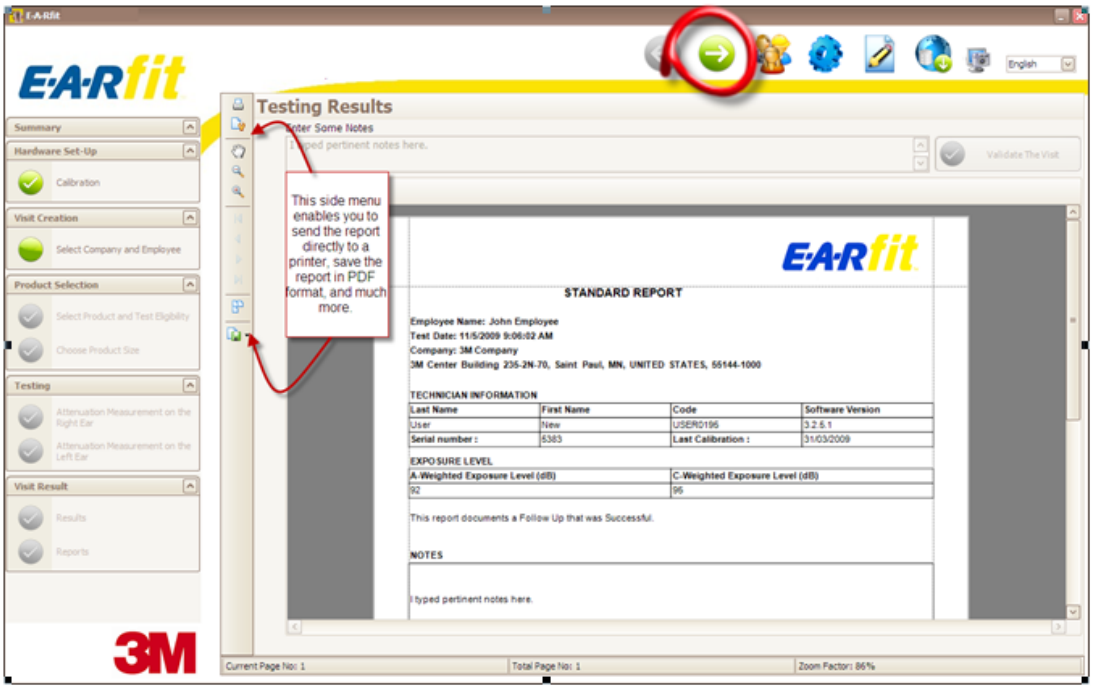
Enter any pertinent notes in the field about the report. Notes entered here will be included on the reports when printed. Click the "Validate This Visit" button to save the visit. The watermark stating "Unvalidated Report" will be removed once it is validated.

Note: Once validated, the report can be generated within the Report Manager. See the Report Manager for more details.

Validation


Validation
The current visit of John Employee is now completed
Please Enter your Password and Validate.
The results of the visit will be stored and the watermark on the report will be disabled.
Enter your Password
Enter Some Notes
Add Notes Here
OK
Cancel

The validation window appears once you click the "Validate This Visit" button. You may add to or modify your notes, enter your password and click "OK". By clicking "OK", the data from this visit is saved within the E-A-Rfit software.


E-A-Rfit
Testing Results
This side menu enables you to send the report directly to a printer, save the report in PDF format, and much more.
STANDARD REPORT
Employee Name: John Employee
Test Date: 11/5/2009 9:06:02 AM
Company: 3M Company
3M Center Building 235-2N-70, Saint Paul, MN, UNITED STATES, 55144-1000
TECHNICIAN INFORMATION
EXPOSURE LEVEL
This report documents a Follow Up that was Successful.
NOTES
I typed pertinent notes here.

A complete session is finalized for this employee. The side menu enables you to send the "Standard" report directly to a printer, save the report in PDF format, and much more. Clicking on the right arrow button will bring you back to the "Select Company & Employee" screen so that you can choose another employee to test.

Employee Manager

Click on this button to open up the “Employee Manager” window. You do not have to be connected to the speaker in order to access this icon.

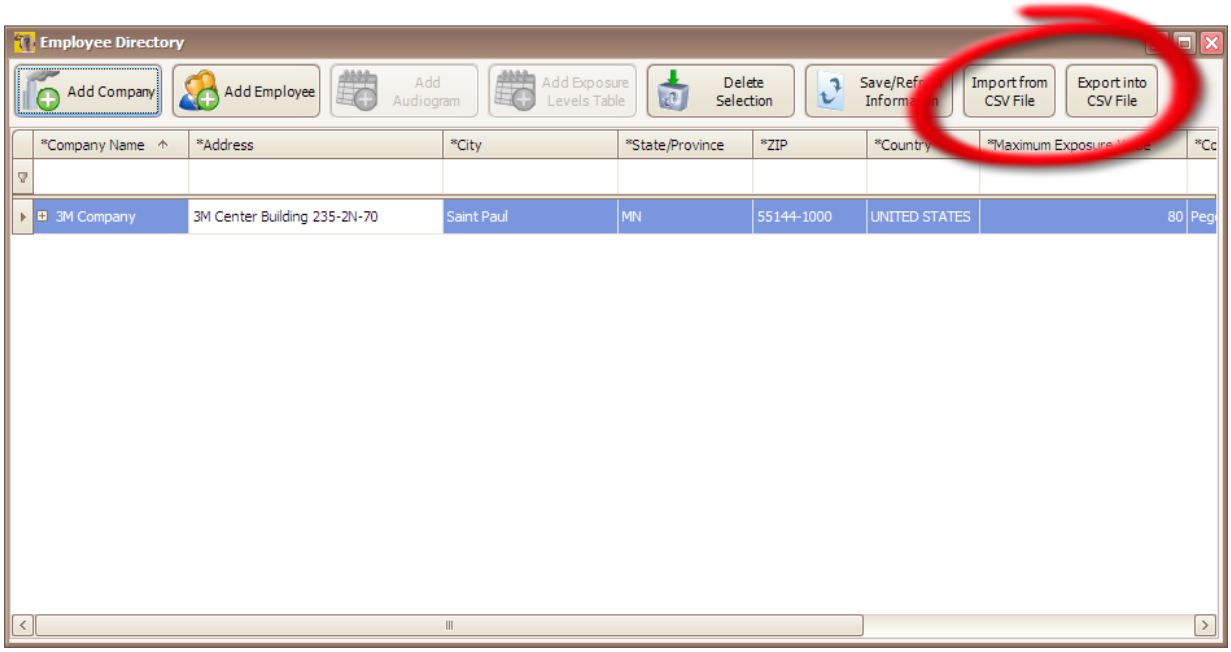
This is an alternate method for adding company and/or employee information. Please refer to the “Visit Creation” section of this manual for details.

Import/Export from and to CSV file

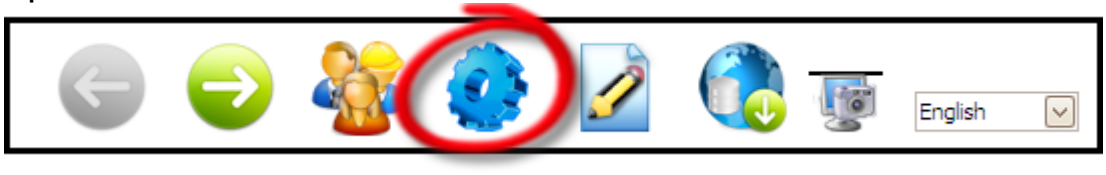
If you have a large group of employees you need to enter into the Employee Directory, you can use the CSV (Comma Separated Value) import/export tool.

In order to import data into your Employee Directory, please conform to the following file structure format:
first name,lastname,number,section,function,gender id,birth year
“Barbara”,”White”,”3456”,”1”,”Occupational Nurse”,”2”,”1968”

Note: An open-source software can be helpful in properly formatting your data.

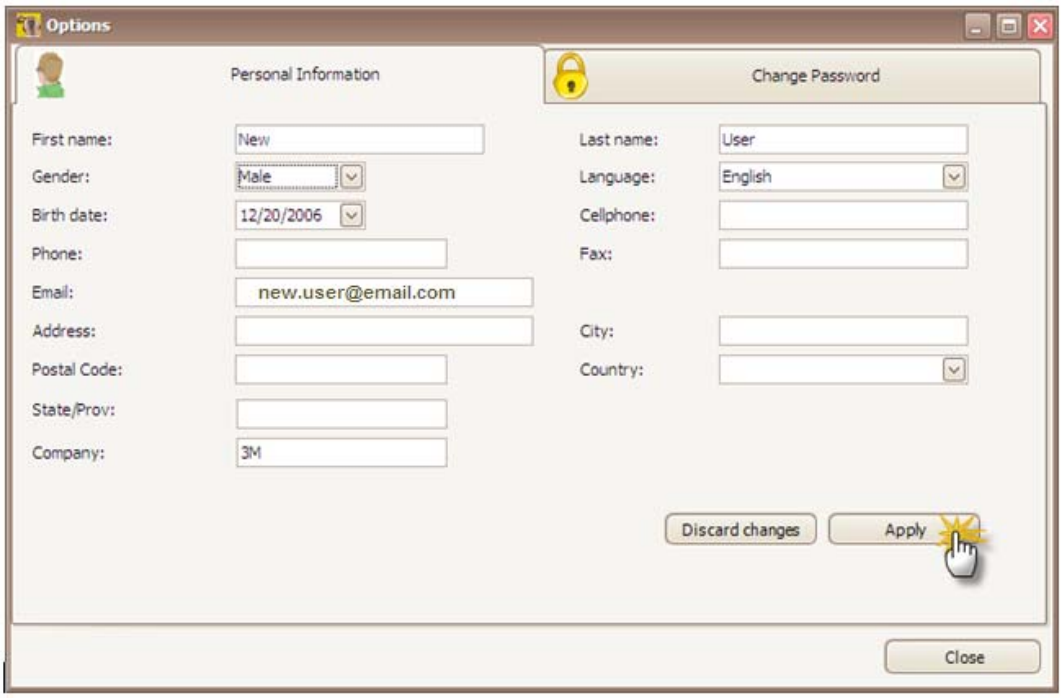


Options



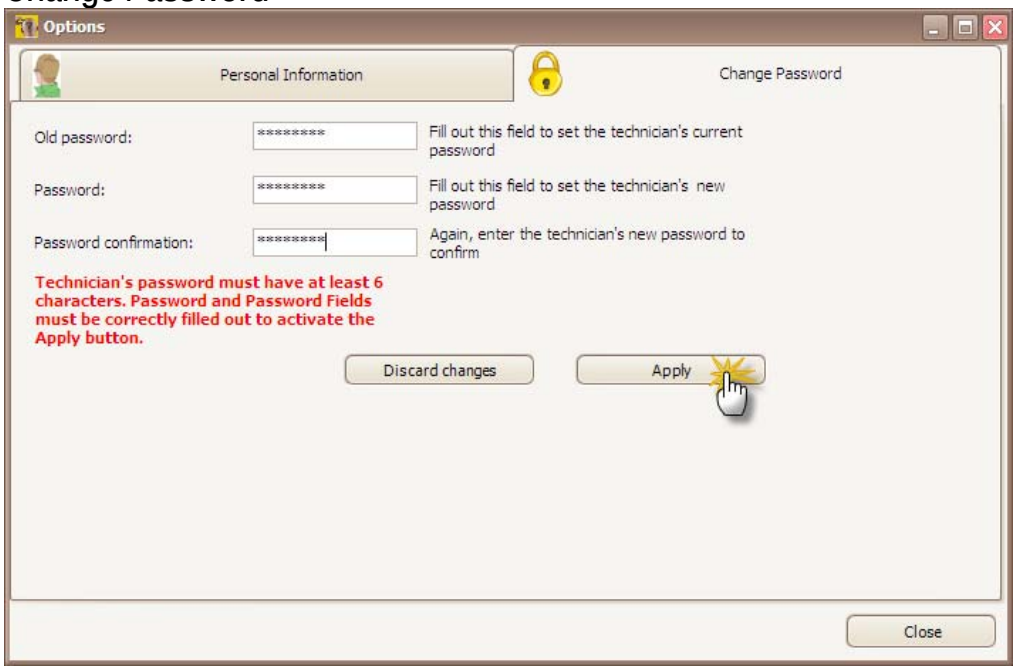
Click on this button to open the Options tabs.

Personal Information



The Personal Information tab displays the demographic information of the technician who is logged in. You may modify this information at anytime. If you are connected to the Internet, the modifications will be uploaded to the main server.

Change Password

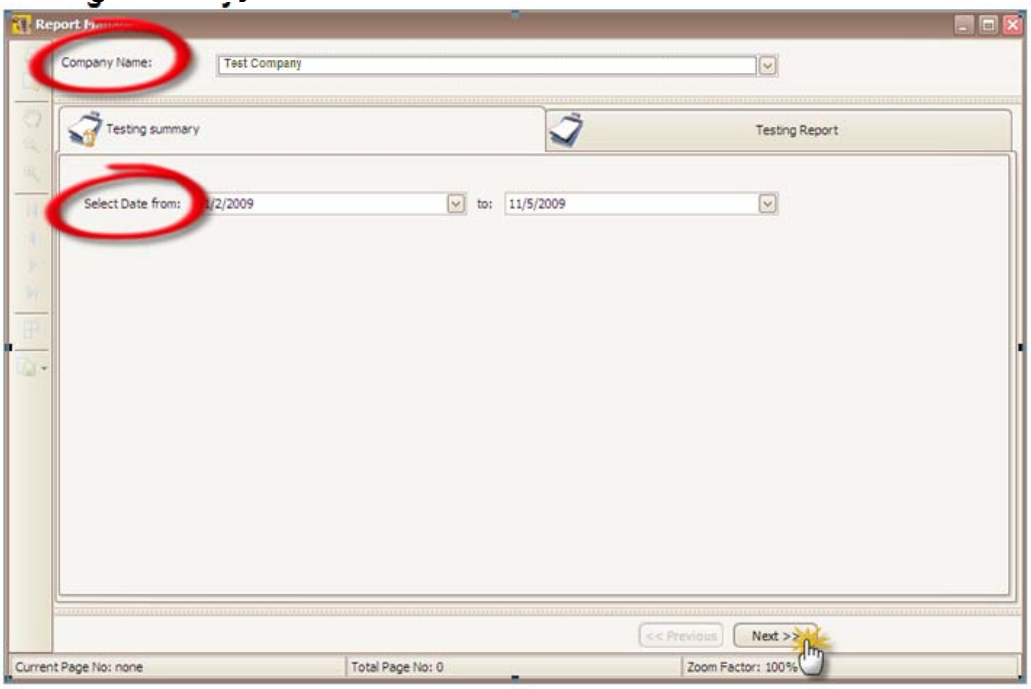

Options
Personal Information
Change Password
Old password:
Fill out this field to set the technician's current password
Password:
Fill out this field to set the technician's new password
Password confirmation:
Again, enter the technician's new password to confirm
Technician's password must have at least 6 characters. Password and Password Fields must be correctly filled out to activate the Apply button.
Discard changes
Apply
Close

You may modify your password on this tab. If you are connected to the internet, your changes will be uploaded to the main server.

Report Manager

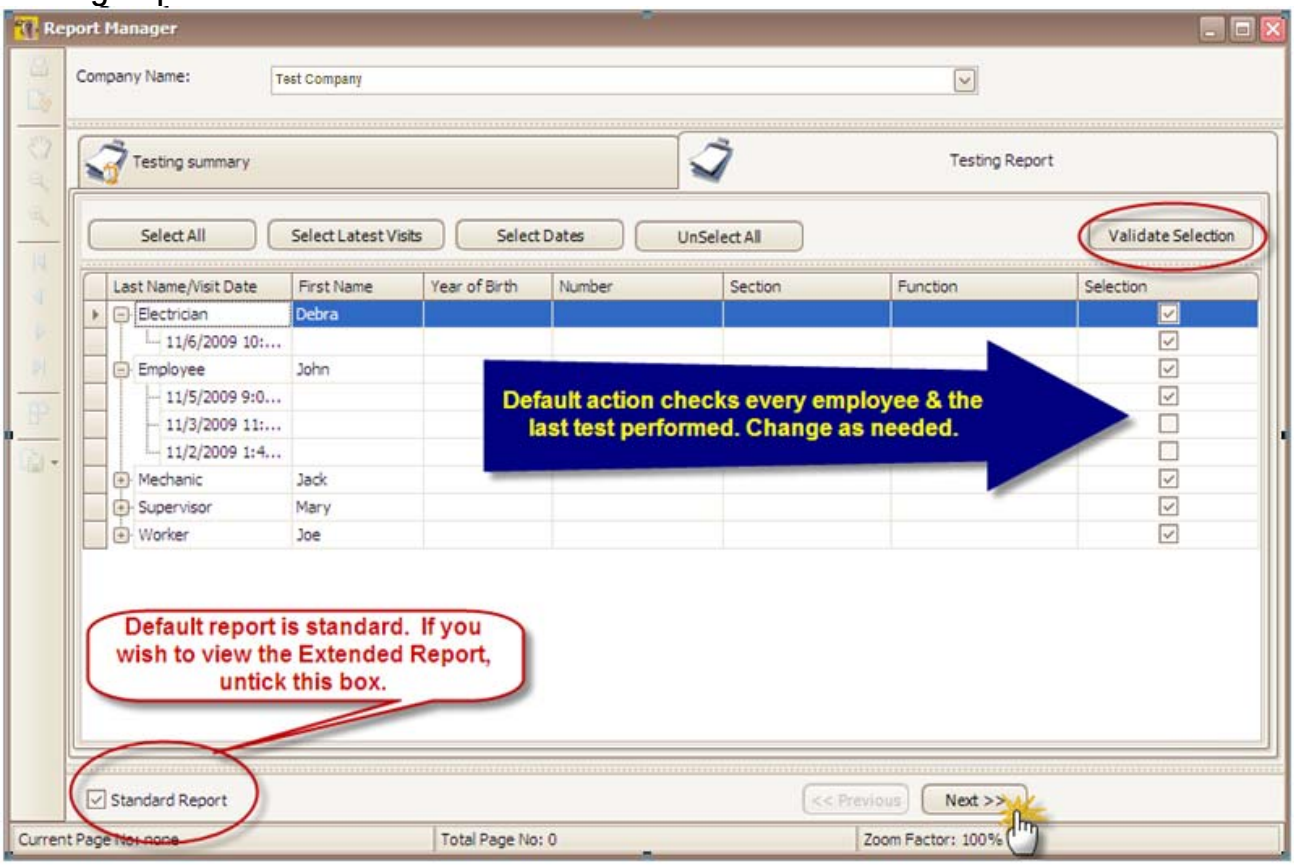
Click on this button to access the “Report Manager” window to generate reports. You do not have to be connected to the speaker to access the report manager.

Testing Summary



Select the “Company Name” and choose the range of dates you wish you review. Click the “Next” button to generate the report.

Testing Report



Choose the company from the drop-down if not already chosen, then click on the Testing Report tab. A list of all employees tested will be visible. You may click on the + sign to expand their record to see the multiple tests performed. The default action is to generate the last test performed on ALL the employees. You may choose:
Select All – Selects every employee and every test performed.
Select Latest Visits - Selects the latest visit on all employees which is the default action.
Select Dates – Selects the tests performed within a specified date range.
UnSelect All – Removes all check marks so that you can manually check the reports you wish to generate.

Anytime a change is made to the default selection, click “Validate Selection”.

The Standard (one-page) Report is the default report generated. If you wish to generate the Extended (three-page) Report, untick this box.

Click “Next” to generate the PDF report(s).

Testing Report – Standard (1 page)

E-A-Rfit

STANDARD REPORT

Employee Name: John Employee
Test Date: 11/5/2009 9:06:02 AM
Company: 3M Company
3M Center Building 235-2N-70, Saint Paul, MN, UNITED STATES, 55144-1000

TECHNICIAN INFORMATION

Last Name	First Name	Code	Software Version
User	New	USER0195	3.3
Serial number :	5383	**Last Calibration :**	31/03/2009

EXPOSURE LEVEL

A-Weighted Exposure Level (dB)	C-Weighted Exposure Level (dB)
92	95

This report documents a Follow Up that was Successful.

NOTES

I typed pertinent notes here.

TEST INFORMATION

	Left Ear	Right Ear	Binaural
Product	E·A·R® Classic®	E·A·R® Classic®	-
Size	Regular	Regular	-
PAR (dB)	25	31	31
Protection Sufficiency	Pass	Pass	Pass
Protected Exposure Level 20% (dBA)	-	-	62
Protected Exposure Level 80% (dBA)	-	-	73

The manufacturer of this attenuation measurement system recommends that an annual calibration be performed.

3M

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3M

Testing Report – Extended (3 pages)

E-A-Rfit

EXTENDED REPORT

Employee Name: John Employee
Test Date: 11/5/2009 9:06:02 AM
Company: 3M Company
3M Center Building 235-2N-70, Saint Paul, MN, UNITED STATES, 55144-1000

TECHNICIAN INFORMATION

Last Name	First Name	Code	Software Version
User	New	USER0195	3.3
Serial number :	5383	**Last Calibration :**	31/03/2009

EXPOSURE LEVEL

A-Weighted Exposure Level (dB)	C-Weighted Exposure Level (dB)
92	95

This report documents a Follow Up that was Successful.

NOTES

I typed pertinent notes here.

TEST INFORMATION

	Left Ear	Right Ear	Binaural
Product	E·A·R® Classic®	E·A·R® Classic®	-
Size	Regular	Regular	-
PAR (dB)	25	31	31
Protection Sufficiency	Pass	Pass	Pass
Protected Exposure Level 20% (dBA)	-	-	62
Protected Exposure Level 80% (dBA)	-	-	73
PAR_20 (dB)	-	-	30
PAR_80 (dB)	-	-	19

The manufacturer of this attenuation measurement system recommends that an annual calibration be performed.

3M

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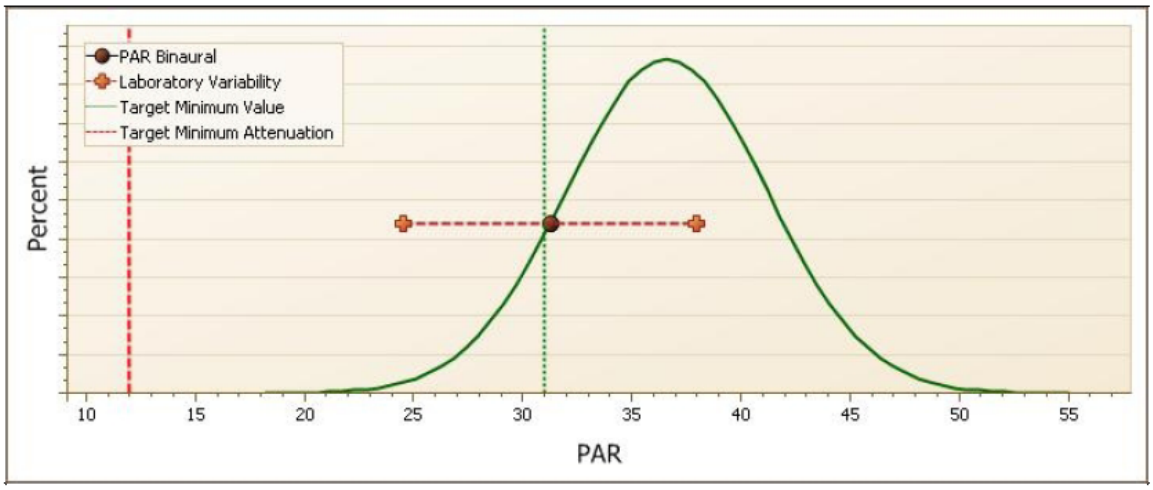
3M

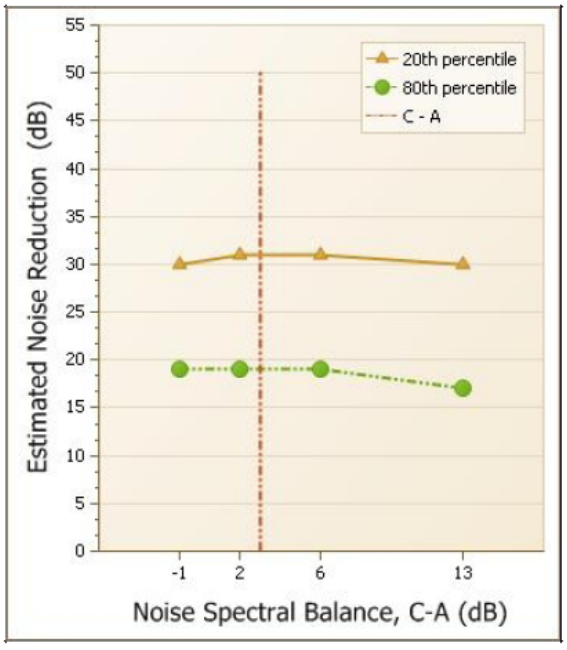
FITTING PROFILE

FITTING PROFILE



ESTIMATED NOISE REDUCTION in various NOISE SPECTRAL BALANCE

GRAPHICAL PAR



COMMENTS

Exposure to sound levels > 110 dBA is extremely hazardous. Therefore we recommend the following in such environments: even though the estimated protection uncertainty from group data is included in the predictions provided by this system, employees should undergo repeat fitting and testing to better train them and to allow computation of their individual uncertainty. This should be accomplished with reinserting and retesting of the HPD multiple times. Furthermore, workers in such hazardous environments should be given audiograms every 6 months for the first 18 months of exposure to ascertain if their hearing levels are indeed being protected.

Regardless of whether the protection measured with this system is deemed adequate for a particular environment, we recommend that double hearing protection be worn when time-weighted average exposures exceed 115 dBA. Double hearing protection attenuation can be estimated by adding 5 dB to the PARs estimated via this system.

Octave Band Values (in dB)

		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Left	Attenuation	22	24	29	25	22	30	34
	Uncertainty	8.0	7.7	8.6	6.7	6.7	5.5	7.0
Right	Attenuation	38	40	52	36	26	35	37
	Uncertainty	8.0	7.7	8.6	6.7	6.7	5.5	7.0
Binaural	Attenuation	38	40	52	36	26	35	37
	Uncertainty	8.0	7.7	8.6	6.7	6.7	5.5	7.0

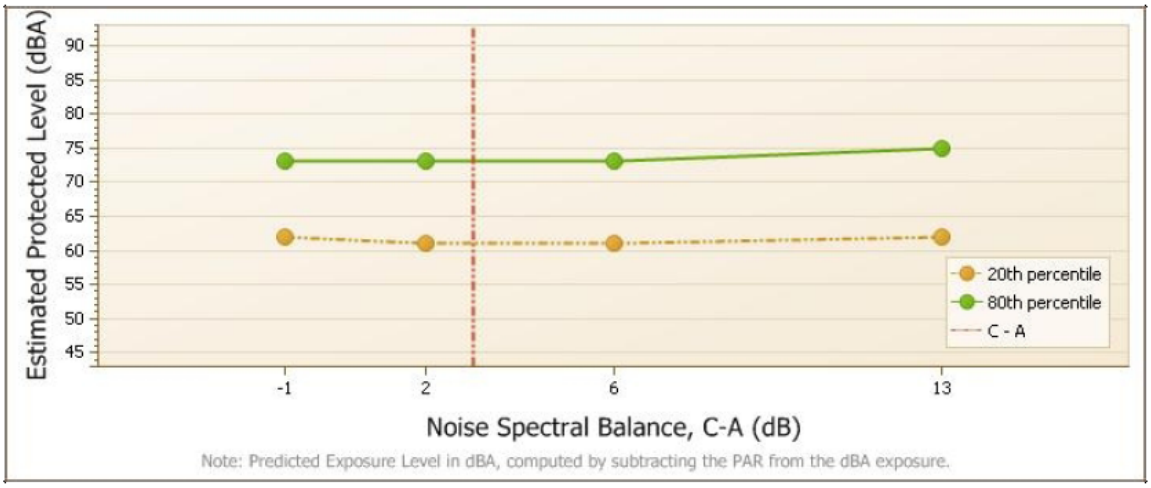
The Octave Band Attenuation data presented above are intended to estimate the attenuation that would be measured in the exact same conditions on that same subject using the real-ear laboratory procedures of ANSI S3.19-1974. The Personal Attenuation Rating is computed in a manner analogous to the NRS(A) values specified in ANSI S12.68 -2007 and suitable for a direct subtraction from an A-weighted Sound Pressure Level (dBA).

COMMENTS

The octave-band (OB) attenuation values for the test(s) just completed appear as pairs of rows. The second row in each pair gives the values adjusted to reflect the uncertainty of the measurements, including the subject-fit variability at the 90th percentile. Also provided are the PARs computed from these data. The OB values can be subtracted directly from either measured OB sound levels or time weighted average values, depending upon the metric that is utilized. The PARs are included for reference and can be subtracted from the measured A-weighted values, however, greater accuracy is provided by using the Graphical PAR found on this report.

PROTECTED LEVEL

PROTECTED LEVEL DIAGRAM



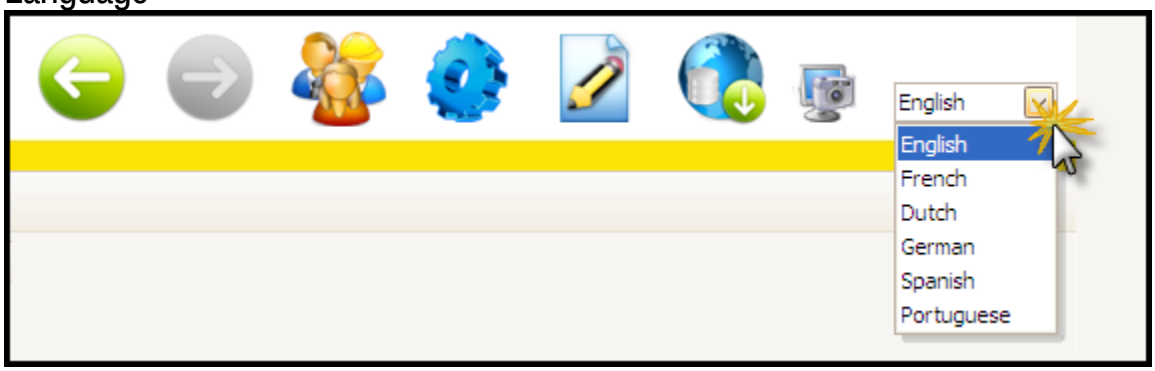
Synchronization (Optional)

In the presence of an internet connection, the “Synchronize Database” icon will be illuminated. Click on this button to automatically upload all the data collected in the E-A-Rfit™ software to the 3M server. This action is optional. If this option is not selected, all testing data will only be saved locally on the computer used for testing

Screen Capture

Click on this button to automatically save a capture image of the current screen on your desktop. This feature is useful primarily for troubleshooting.

Language



Use the drop-down menu to select the software language. The default language is “English”. You may change the select a different language at any time while you are within the E-A-Rfit software.

Troubleshooting Guide

Error #	Error Message	Problem Description	Possible Solutions
General Issues			
	"Your hardware is not detected".	Your hardware is not being recognized or you are not properly connected	*Are all connections secured? If not, click Cancel to exit the E-A-Rfit™ software, secure connections, and re-open the software. If you wish to continue and have limited access, click OK. *Did you install the hardware drivers for all the computer's USB ports? Refer to the E-A-Rfit™ Full Installation Guide and follow the instructions for installing the USB drivers.
	"An instance of this application is already running".	You have clicked the E-A-Rfit short cut more than once.	*Click OK to close the pop-up window. Wait for the software to open up.
5040	"USB traffic Jam. Disconnect any unused USB devices connected to your computer; ensure that your speaker is directly connected to your computer USB port (not via hub or port replicator) reboot your PC to reset the USB Communication Stack".	There has been an interruption in the communication between the speaker and the software.	*Limit the use of other USB ports while running the E-A-Rfit™ software such as USB connected printers, projectors, & docking stations. *Close down the software, unplug the USB, unplug the power to the speaker. Reboot the computer, re-plug the speaker power cord, re-plug the USB to connect the speaker. Then launch the E-A-Rfit software.
Account Creation Issues			
	"Your technician code is inactive or has been revoked. Also, be sure the technician code and password are correct".	A problem exists with your code or your password.	*Be sure you have typed the technician code & password in the corresponding field correctly. Contact Technical Support @ 1-800-243-4630., if the problem continues. *Do not try to register the codes DEMO0032 and/or TRAI0086. They cannot be registered.
	"Error connecting to the server: Unable to connect to any of the specified MySQL hosts OR cannot connect to the remote database".	You are unable to connect to the 3M server via the internet	*Check your internet connection and try again. If you are using a wireless router, consider connecting directly to the Ethernet cable line, and try again. If you are behind a router or firewall, please contact your network admin and check to be sure Port 80 or 3306 are open. Please refer to the Software Communication Requirement in the E-A-Rfit Full Installation Guide.

Error #	Error Message	Problem Description	Possible Solutions
Calibration Issues			
	"A critical error has occurred. Please make sure your microphone is properly installed. Your hardware will be checked again".	The calibration is unsuccessful and you will not be able to proceed with testing	*Check to be sure that the microphone is placed in the proper orientation on the speaker microphone clip with the tip directed downwards. *Check to be sure that the microphone tip is tightly attached to the microphone. *Check to be sure the microphone tip clean. Use the microphone cleaning tool provided in the testing kit to clear any debris from the tip. *Be sure the hardware (speaker) is free standing and away from reflective surfaces such as walls and cabinets. *Check if all the connections are secure. *The calibration graph will automatically display when a calibration check is performed. The calibration check will be compared to the Baseline calibration. If today's response is touching the Factory Maximum, the problem is with the reference microphone. You can use the palm bellows and gently blow air on it and/or use a dry paper towel to gently clean it. If today's response is touching the Factory Minimum line, the problem is with the measurement microphone. Clean the microphone tip. *If still unsuccessful, take a camera shot of the calibration screen for future reference which can be used by a 3M technician to fix the problem. Try another microphone.
Testing Issues			
#1	"The external microphone is not detecting the expected sound level. Check distance and elevation of speaker".	The external microphone is not detecting the correct sound.	*Be sure the speaker clip is level with the employee's eyes, check the distance away form the speaker, and retest.
#2	Something is interfering with the measurement. Look for cord friction, employee swallowing, talking moving jaw, electromagnetic fields, or power supply interference. Fix and retest.	Something is interfering with the measurement.	*Be sure the employee is not swallowing, talking, or moving their jaw during the test. *Check to be sure there is no cord friction. Drape the cord over the employee's shoulder to keep cord from touching the table. *Clean the microphone tip *Power supply may be shared with an intermittent high consumption device. Find a separate circuit. *If an electromagnetic field is near, move the system to a less exposed area. *After confirming the interference, retest.

Error #	Error Message	Problem Description	Possible Solutions
#3	"Acoustic Seal Failure Re-educate, retest, and/or refit". *(applies only to the E-A-R™custom product)*	The E-A-R™custom does not meet the acoustic seal criteria.	* Instruct the employee on the proper fit of the plug. Be sure the employee has seated the E-A-R™custom into their ear and click "RETRY". If error continues for a total of 2 tests, you will need to make a new plug. If remaking the plug does not fix the error, the employee cannot be fit. Click "Cancel" and bank the erroneous measurement. This visit is considered "unsuccessful". *Fit the plug yourself & test but don't bank the measurement to see if there is a fitting issue. *If testing the S2/M2 product, use new testing probe. *Ensure that the microphone tip is tight on the microphone.
#4	"This test indicates there may be problems with your equipment. Please check the equipment, check distance, and elevation of the speaker and retest".	There may be a mechanical issue with the equipment.	*Make sure the microphone tip and the testing tube is clear. Use the microphone cleaning tube, the probe insertion tool, and/or the palm bellows to clear the microphone tip and testing tube. *Verify the microphone tip is inserted completely into the test probe sleeve. *Confirm that the reference microphone should be facing up, without any obstruction.
#5	"The measurement is erroneous. Check distance and elevation of the speaker and retest".	The data gathered by the measurement system does not meet normal specifications.	*Check the distance and height of the speaker from the employee. *Clear any lubricant from the testing probe with the palm bellows if testing the E-A-R™custom. *Check the calibration of the speaker and microphone. If calibration is not successful, switch microphones and check calibration. Successful calibration of the original microphone is likely after it has had a chance to "rest". Occasionally, after many successive tests, the microphone becomes warm and saturated with condensation resulting in erroneous results. *If all else fails, shut down the software, unplug the USB, unplug the speaker power, re-plug the speaker power, then the USB, and relaunch the E-A-Rfit™ software.
#7	"The internal microphone is picking up too much noise. Check placement and quality of fit. Move the subject slightly away from the speaker and retest".	The sound pressure levels are unusually high under the hearing protector.	*Move the subject slightly away from the speaker and retest until you are able to produce a measurement.

Error #	Error Message	Problem Description	Possible Solutions
#8	"The external microphone is picking up too much noise. Move the subject slightly away from the speaker and retest".	The sound pressure levels are unusually high on the outside of the hearing protector.	*Move the subject slightly away or towards the speaker and retest until you are able to produce a measurement
#9	"The internal microphone is not picking up enough noise. Clean the microphone tip and/or probe tube. Move the subject slightly away from the speaker and retest".	The sound pressure levels are unusually low underneath the hearing protector.	*Check to be sure that the microphone tip is without debris and cleaned. *Be sure the testing probe tube is not kinked. *Retest
#10	"The external microphone is blocked. Gently clean the external microphone. Verify its placement and retest".	The sound pressure levels measured by the external microphone are unusually low.	*Gently blow air on the external microphone with the palm bellows and/or use a dry paper towel to gently clean it. *Check placement of the microphone on the magnetic clip to be sure the external microphone is vertical and unobstructed. *Retest
#11	"The cable and/or the microphone may be broken/disconnected. Verify and retest".	Something is interfering with the cable or microphone.	*Check to see that the cable is not detached from the microphone and/or the full length of cable is not broken then, retest.

Test results, PAR values and hearing protector sufficiency determinations are based upon data entered by the Technician and the employee's test results from a given E-A-Rfit testing session.

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